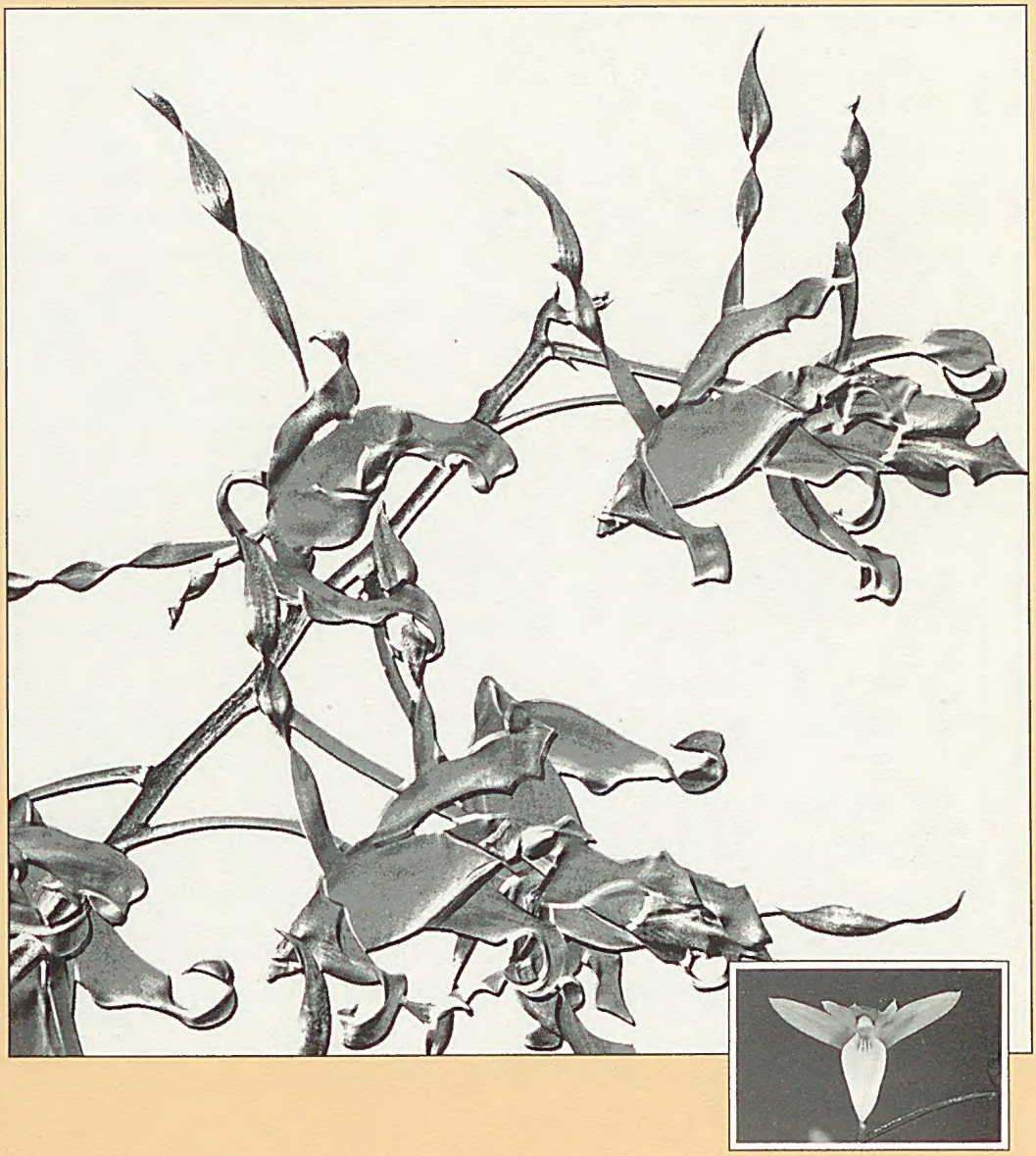
LASIANTHERA

The Scientific journal for the Orchidaceae of Papua New Guinea



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LASIANTHERA

The scientific publication of the National Capital Botanical Gardens, Port Moresby, Papua New Guinea.

Lasianthera (ISSN 1028-253X) reports on original research within the family Orchidaceae. Contributions are invited from researchers in the fields of systematics, physiology, cytology, anatomy and morphology, physiochemistry, pollination biology, ecology, hybridizing and evolution. Preference will be given to studies involving taxa from Papua New Guinea and surrounding region. It is intended that two issues will be produced annually.

Correspondence
Correspondence concerning manuscripts for publication in **Lasianthera** should be directed to the Editor.

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Footnote: Lasianthera was launched on the 26 September 1996 at the 3rd Australian Native Orchid Society Conference in Adelaide.

EDITOR'S MESSAGE

This special edition of Lasianthera shows the true beauty of Papua New Guinea's exotic treasures.

Phil Spence, Head of the Orchid Research Centre of the National Capital Botanical Gardens, has introduced a new concept for recording orchid species which simplifies identification. This concept has been used in this issue of 'Lasianthera'.

The new method has been initiated to promote and show the different identifying features and characteristics of our orchids.

Also in this issue, contributions from Wayne Harris, David Jones and Dr. Mark Clements once again demonstrate what is still undiscovered in the realms of our unique landscape.

The importance of this journal cannot be understated and it is our objective to ensure this country is eventually recognised for one of its richest assets, the Orchids of Papua New Guinea.

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CANNAEORCHIS, A NEW GENUS OF DENDROBIINAE (ORCHIDACEAE) FOR THE TAXON PREVIOUSLY KNOWN AS DENDROBIUM *SW.* SECT. *MACROCLADIUM* SCHLTR.

by

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ABSTRACT:
The new genus *Cannaeorchis*, endemic to New Caledonia, is described to account for the group of species previously treated under *Dendrobium* Sw. sect. *Macrocladium* Schltr., following a phylogenetic analysis of *Dendrobium* Sw. subgen. *Xerobium* Schltr. (Dendrobiinae: Orchidaceae). *Cannaeorchis* is characterised and circumscribed and the taxonomy, habitat and ecology details are provided for the 11 described species.

Results of a phylogenetic analysis of *Dendrobium* Sw. subgenus *Xerobium* Schltr. (Clements in prep.), provide strong support for the recognition of sections *Aporum* (Blume) Lindl., *Oxystophyllum* (Blume) Miq., *Grastidium* (Blume) J.J. Smith, *Eriopexis* Schltr., *Pleianthe* Schltr., *Macrocladium* Schltr., *Monanthos* Schltr., *Herpethophytum* Schltr. and *Macrocladium* Schltr., at generic rank as distinct from *Dendrobium sensu stricto*.

Section *Macrocladium* was described and characterised by Schlechter (1906) based on terrestrial habit, tall woody stems, distichous leaves and lateral, single-to multi-flowered racemes. He cited *Dendrobium sarcochilus* A. Finet, *D. fractiflexum* A. Finet and *D. steatoglossum* Rchb.f. as characteristic of the group, but was doubtful about the inclusion of another New Caledonian species, *D. finetianum* Schltr. within the taxon. He also described *D. cymatoleguum* Schltr. and the variety *major* Schltr. in that publication. In his treatment of D. subgenus *Xerobium* (Schlechter 1911-14), Schlechter reaffirmed his original concept of the group whilst suggesting the possible inclusion of *D. cunninghamii* Lindl. from New Zealand. The latter species has since been segregated into the monotypic genus *Winika* (Clements, Jones & Molloy 1997).

Most modern botanists when dealing with *Dendrobium sens. lat.*, agree with Schlechter's treatment of these orchids. Brieger (1981), however, in his revision of the Dendrobiinae, preferred instead to include section *Macrocladium*, as a section within his broad concept of *Grastidium* Blume. The results of a phylogenetic analysis of D. subgenus *Xerobium* (Clements in prep.) do not support Brieger's concept of the taxon.

The purpose of this paper is to describe and characterise D. sect. *Macrocladium* at generic rank, to review the taxonomy and status of all species within the genus, provide data on their ecology and distribution and a key to species.

MATERIALS AND METHODS

The materials and methods used are the same as those described by Clements and Jones (1997).

TAXONOMY

Cannaeorchis M.A. Clem. et D.L. Jones, genus novum affinis *Kinetochilo* (Schltr.) Brieg. a qua habitu terrestri, radicibus verrucosis carnosis crassis, caulibus erectis cannoideis usque 5 m altis, et labello basi articulato sed non libere mobile differt.

Type species: *Dendrobium fractiflexum* A. Finet

Synonyms: *Dendrobium* Sw. sect. *Macrocladium* Schltr., Bot. *Jahrb.* 39: 68 (1906); *Grastidium* Blume sect. *Macrocladium* (Schltr.) Brieger in Schltr., *Die Orchideen* (ed. 3) 1(11-12): 653 (1981). Type species: *Dendrobium sarcochilus* A. Finet, *D. fractiflexum* A. Finet and *D. steatoglossum* Rchb.f.

Terrestrial herbs, sympodial. Protocorm discoid-conical, the primary roots arising from stem nodes. Roots long-creeping, thick, fleshy, slightly to strongly verrucose, terete to flattened, much-branched. Stems slender, terete or slightly laterally flattened, cane-like or bamboo-like, pseudo-

indeterminate, simple or branched, rarely bearing aerial growths, older parts covered with persistent leaf sheaths. Leaves one per node, alternate, distichous; sheathing base tubular, encircling the stem; lamina sessile, thinly coriaceous, green or purplish, twisted at the base and aligned more or less in a flat plane, apex unequally emarginate. Inflorescence racemose, rarely a sparse panicle, consisting of a thin wiry peduncle and rachis and thicker pedicels, lateral or rarely terminal, single or multi-flowered, when lateral arising at right angles to the stem, leaf opposed, flowers alternate, opening sequentially from the base, evenly spaced; flowering irregularly; flowers resupinate, opening widely, dull or sometimes colourful, long-lived. Dorsal sepal free, similar in shape and size to lateral sepals. Lateral sepals united basally to each other and to the column foot, similar to the dorsal sepal. Petals free, slightly shorter and narrower than the sepals. Mentum consisting of the bases of the lateral sepals and the margins of the column foot. Labellum free, hinged to the base of the column foot, protruding conspicuously from the perianth; lamina entire or three-lobed, often fleshy, much longer than wide, margins entire or convolute. Callus consisting of 3-5 thickened central ridges extending along most of the lamina, often with radiating lateral lines. Column fused completely; column wings fused to the column, the apical extensions projecting and flanking the anther. Column foot as long as or longer than the column, curved, ending in a small shallow sac. Anther incumbent. Pollinia 4 in 2 pairs, waxy. Stigma entire, deeply sunken, with a projecting basal flange. Rostellum ventral, broad. Capsule narrowly obovoid, pendulous, lacking ornamentation, dehiscing by slits. **(Fig. 1)**.

A genus of c. 11 species, endemic to New Caledonia including some off-shore islands, and confined almost exclusively to maquis vegetation and the margins of stunted rainforest on areas of ultrabasic rock. All species are terrestrial in habit, rarely occurring as epiphytes on the base of trees or shrubs.

Etymology: The name chosen is based on use of the common name in New Caledonia for members of this group, viz 'Orchidée à canne', or 'Canne dendrobes' (Hallé 1977). If elevated to generic rank, the name *Macrocladium* was considered too similar to the palm genus *Macrocladus* Griffith.

Characteristics: *Cannaeorchis* is easily separated from *Dendrobium sens. str.* with which is has been included by various authors. Key characters are:-

1) roots thick, fleshy, mostly verrucose;
2) stems cane-like or bamboo-like, of pseudo-indeterminate length, purple-brown during early developmental phase;
3) inflorescences lateral or occasionally terminal, emerging from a node opposite a leaf lamina and breaking through its leaf sheath;
4) inflorescences consisting of a thin wiry peduncle and rachis and thicker pedicels;
5) flowers alternate, opening sequentially, usually the basal flowers first, spread out more or less evenly along the rachis and facing outwards;
6) labellum lamina entire or three-lobed, much longer than wide, margins entire or crenulate;
7) lamina callus consisting of 3, rarely 5, thickened central ridges extending for most of the length of the labellum; and
8) protocorm discoid-conical type.

Key to species

1. Plants lacking the ability to produce more than 2 flowers per raceme **2**
Racemes multiflowered (usually 4-c. 40) **4**

2. Flowers white; labellum spathulate . . .**C. delumbe**
Flowers green or reddish; labellum narrowly oblong **3**

3. Leaves c. 20 mm wide; flowers c. 25-30 mm diam.; petals broadly ovate-lanceolate . . . . . .**C. steatoglossum**
Leaves c. 8 mm wide; flowers c. 35-45 mm diam.; petals narrowly oblanceolate . . . . . .**C. verruciferum**

4. Labellum with distinct lateral lobes, ending in an acute point . . . . . .**C. cymatoleguum**
Labellum with obscure lateral lobes, never acute, the margins continuous with the mid-lobe . . .**5**

5. Flowers 40-50 mm diam. **6**
Flowers 20-35 mm diam. **7**

6. Racemes pendulous; flowers cream to white; petals linear . . . . . .**C. fractiflexum**
Racemes erect; flowers olive green to brown; petals obovoid . . . . . .**C. deplanchei**

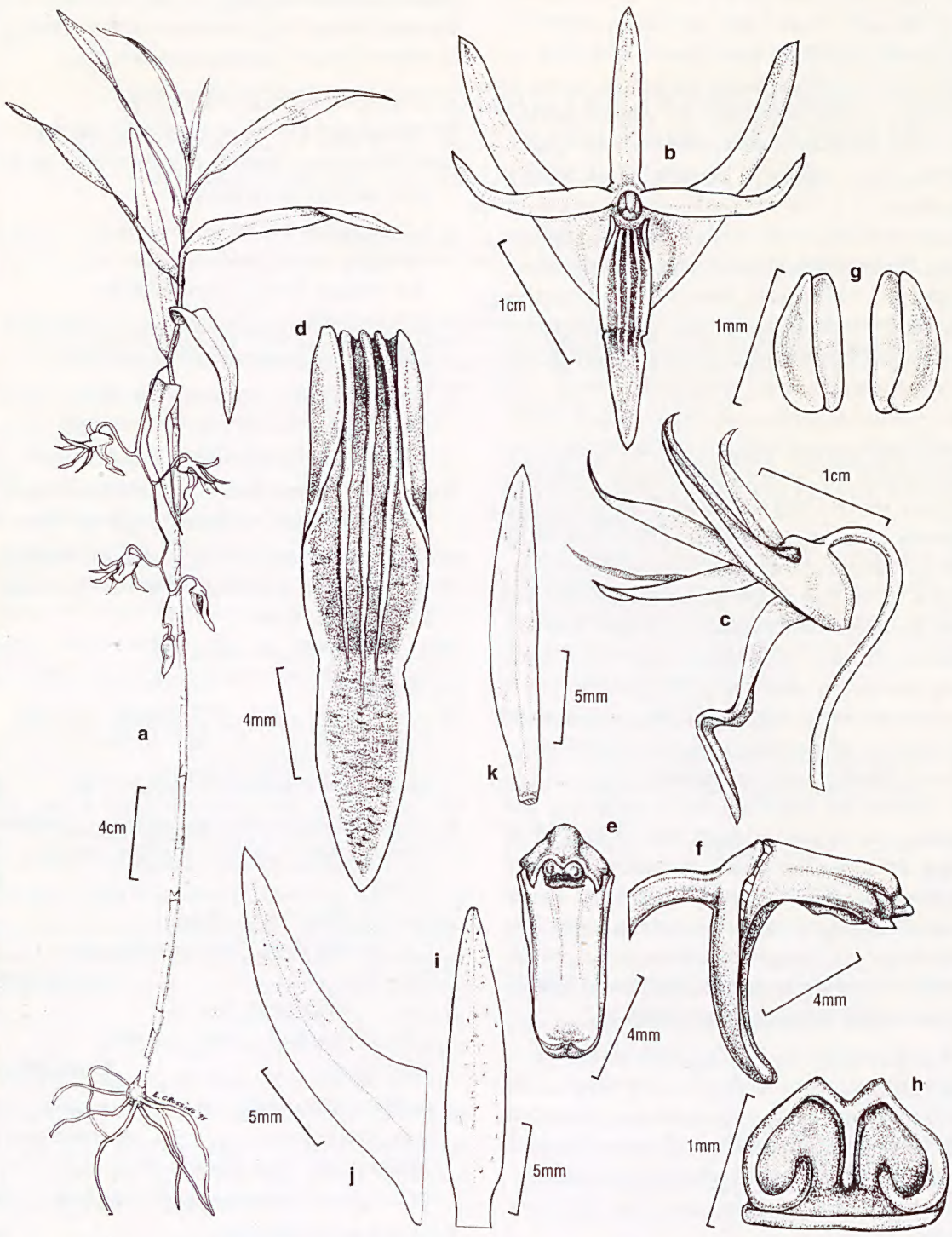


Figure 1. *Cannaeorchis fractiflexum*, road to Yaté, New Caledonia, *Clements* 7838: **a.** plant: **b.** flower from the front: **c.** flower from the side: **d.** labellum from above: **e.** column from front: **f.** column from side: **g.** pollinium: **h.** anther cap from the front: **i.** dorsal sepal : **j.** lateral sepal: **k.** petal. (Illustration by Lisa Crossing)

1. Maquis scrubland on ultrabasic substrate in southern New Caledonia, the habitat of several species of *Cannaeorchis*.

3. *Cannaeorchis steatoglossum*, Creek Pernod area, *Clements* 9378

2. *Cannaeorchis verruciferum*, Riviere Blue, *Clements* 9358

4. *Cannaeorchis polycladium*, forest overlooking Yaté, *Clements* 9375

7. Labellum margins convolute 8
Labellum margins entire 9

8. Racemes porrect; flowers about 20 mm diam.; leaves to 9 mm wide .....**C. megalorrhizum**
Racemes erect; flowers about 30 mm diam.; leaves to 15 mm wide .....**C. sarcochilus**

9. Labellum mid-lobe obovate/ spathulate .....**C. vandifolium**
Labellum mid-lobe ovate **10**

10. Plants to c. 0.5 m tall; labellum mid-lobe narrowly ovate, papillate ..... **C. atractoglossum**
Plants to 2 m tall; labellum mid-lobe broadly ovate, smooth .....**C. polycladium**

Species list

1. *Cannaeorchis atractoglossum* (N. Hallé) M.A. Clem. et D.L. Jones, *comb. et stat. nov.*

Basionym: *Dendrobium polycladium* Rchb.f. var. *atractoglossum* N. Hallé, *Flore de la Nouvelle-Caledonie et Dependances* 8: 66-67, t. 21. (1977). Type: Nouvelle-Caledonie: Montagne de Poum, 300m, 8 Nov. 1943, *R.Virot* 1399 (holo P!; iso AMES!).

ILLUSTRATION: Hallé (1977), t. 21 - as *Dendrobium polycladium var. atractoglossum.*

DISTRIBUTION AND ECOLOGY: Endemic to New Caledonia where known from three well separated sites towards the north; grows as a terrestrial in maquis.

NOTES: This species is characterised by thin stems 20-50 cm tall, 1.5-4 mm diam.; racemes usually one or two flowered (rarely up to five); flowers green-yellow maturing to pale pink; long narrow acute tepals; and long narrowly oblong-elliptical decurved, acute labellum with the ventral surface papillate in the distal half.

Cannaeorchis attractoglossum is allied to *Dendrobium polycladium* Rchb.f. and *D. steatoglossum* Rchb.f. but can be readily distinguished by the slender habit, narrow sepals and narrow acute labellum papillate near the apex.

SPECIMENS EXAMINED: New Caledonia; Massif de Boulinda, alt. c. 720 m, *Jaffré* 952 (NOU); Plateau au N. de Negropo, alt. c. 600-700 m, 4 Mar. 1973, *MacKee* 26360 (NOU); Boulinda, alt. c. 500 m, 5 Sep. 1971, *Schmid* 4026 (NOU); Kopeto versant Nord, alt. c. 600 m, 11 Dec. 1970, *Veillon* 2218 & 2219 (NOU); Massif du Tchingou pente Sud-Est. RVB avec colluvion, alt. c. 800 m, *Veillon* 6145 (NOU).

2. *Cannaeorchis cymatoleguum* (Schltr.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium cymatoleguum* Schltr., *Bot. Jahrb.* 39: 75 (1906); *Grastidium cymatoleguum* (Schltr.) Rauschert, *Feddes Rep.* 94(7-8): 448 (1983). Type: New Caledonia: Southern District; Between river rubble on the banks of the Ngoye, alt. c. 50m, Nov. 1902, *R. Schlechter* 15141 (holo B†; iso BM!, HBG!, K!, P!, W!, Z!).

Dendrobium cymatoleguum Schltr. var. *major* Schltr., *Bot. Jahrb.* 39: 75 (1906). Type: New Caledonia: Southern District; On the mountains slopes near Ngoye, alt. c. 600m, Nov. 1902, *R. Schlechter* 15151a (holo B†).

Dendrobium schinzianum Kraenzl., Neu-Caledonische Orchidaceen, *Viertelj. Naturf. Ges. Zürich* 74: 85 (1929); *Grastidium schinzianum* (Kraenzl.) Rauschert, *Feddes Rep.* 94(7-8): 452 (1983). Type: New Caledonia; Mt Humboldt, 9 Nov. 1924, *A.U. Däniker* 575 (holo Z!).

ILLUSTRATIONS: Hallé (1977), t. 32, 33; Bégaud *et al.* (1995), p. 68 - both as *Dendrobium cymatoleguum*; Hallé (1977), t. 34 - as *Dendrobium cymatoleguum var. major.*

DISTRIBUTION AND ECOLOGY: Endemic to New Caledonia where uncommon in southern areas and only found as far north as Mt Humboldt; terrestrial in strand forest or serpentine scrubland (Bégaud *et al.* 1995).

NOTES: This species is characterised by glaucous sheaths; glaucous light green leaves with a pinkish margin; 3-10-flowered inflorescence which is frequently sparsely paniculate at the first fertile node; reddish-brown flowers with lilac and white markings; and acute apices on the labellum lateral lobes. Plants have canes to 2.5 m tall

"This species is closely related to *Dendrobium sarcochilus* Finet in floral structure, and especially in the labellum. However, it is easily recognised by its smaller foliage, shorter inflorescences and by its labellum. The flowers are brown, with a white crest on the labellum" (Schlechter 1906).

Schlechter distinguished var. *major* by the flowers being a little larger and with a slightly more lax inflorescence. Many species of *Canneorchis* are somewhat variable in floral and vegetative morphology and in this case the variation

5. Maquis scrubland at Creek Pernod

7. *Cannaeorchis cymatoleguum*, ex Mt Koghis, Ziesing 292

6. *Cannaeorchis steatoglossum*, Clements 9378

8. *Cannaeorchis verruciferum*, near Yaté

9. *Cannaeorchis fractiflexum*, forest overlooking Yaté, Clements 9348

10. *Cannaeorchis fractiflexum*, road to Yaté, Clements 7858

11. *Cannaeorchis deplanchei*, Mt Do

13. *Cannaeorchis cymatoleguum*, [var. *major*], near Yaté, *Ziesing 118*

12. *Cannaeorchis polycladium*, ex forest overlooking Yaté, *Clements 9375*

14. *Cannaeorchis cymatoleguum*, ex Mt Koghis, *Ziesing 292*

encompasses Schlechter's variety. The type of *C. cymatoleguum* has flowers with three reduced callus ridges (Hallé 1977), whereas the majority of collections have five. Since the type of var. *major* has been destroyed, and Schlechter makes no mention of any additional ridges in the protologue, then it cannot be assumed that his varietal name refers to that entity.

SPECIMENS EXAMINED: New Caledonia; col de Plum, route de la R. des Pirogues, 28 Oct. 1970, *Jaffré* 413 (NOU); plaine des Lacs, vallée de Creek Pernod, alt. 200 m, 18 July 1976, *Aymard* (*MacKee* 31605) (NOU); Road de Yaté, Les Dalmates, 25 May 1986, *MacKee* 43120 (NOU); Montagne des Sources, alt. c. 900 m, 22 July 1988, *MacKee* 44006 (NOU); S. du Kuébini, 18 Aug. 1970, *Schmid s.n.* (NOU); Montagne des Sources, 5 Oct. 1967, *Veillon* 1383 (NOU); Montagne des Sources, piste de Case-Cou, alt. c. 750 m, 11 July 1972, *Veillon* 2670 (NOU); Bord de Lac en Y, 3 Aug. 1972, *Veillon* 2671 (NOU); Mt Koghis, Nov. 1992, *Villegente* (*Ziesing* 292) (CANB 9217961); cultivated ANBG, 14 May 1993 ex New Caledonia; Noumea to Yaté road, between turn-off to Chutes de la Madeleine and Col du Yaté, Nov. 1992, *Ziesing* 118 (CANB 9217787).

3. *Cannaeorchis delumbe* (Kraenzl.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium delumbe* Kraenzl., *Viertelj. Naturf. Ges. Zürich* 74: 84 (1929). Type: Neu-Caledonien; Koniambo near Koné, 18 Jan. 1925, *A.U. Däniker* 927*a* (holo Z!).

ILLUSTRATIONS: None found.

DISTRIBUTION AND ECOLOGY: Endemic to New Caledonia where at present known only from the type locality; terrestrial in maquis.

NOTES: This species is characterised by one or two-flowered inflorescence; a prominent curved mentum; broadly linear obtuse dorsal sepal; linear slightly curved petals; and a porrect fleshy spathulate labellum which is thickest along the margins of the midlobe.

Kraenzlin (1929) distinguished the species as "Labellum undivided, spathulate, lateral lobes almost nil, the margins obscure and wrinkled, thick, fleshy, and a fleshy disc with three prominent ridges. The flowers are white".

Hallé (1977) treated this species as a synonym of *D. polycladium* but examination of the types shows the two to be florally distinct. Flowers of *D. delumbe* have a prominent curved mentum, linear petals and a spathulate labellum. In *D. polycladium* the mentum is relatively obscure, short and nearly straight, the petals widen slightly near the middle and the labellum is narrowly oblong.

A collection by *Veillon* 3525, Kouaoua: decharge Montmartre, 14 Feb. 1978 (NOU) has some features similar to *D. delumbe*, including a spathulate labellum, but there are up to three flowers per inflorescence, the flowers are slightly larger, sepals and petals are longer and more acute and the labellum margins slightly crenulate. This may represent a new taxon but further collections from northern areas in New Caledonia are needed before an accurate assessment can be made.

4. *Cannaeorchis deplanchei* (Rchb.f.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium deplanchei* Rchb.f., *Linnaea* 41: 90 (1877); *Grastidium deplanchei* (Rchb.f.) Rauschert, *Feddes Rep.* 94(7-8): 448 (1983). Type: Nova Caledonia, 1863, *M. Deplanche* 162 (holo W!; iso P!).

ILLUSTRATION: Hallé (1977), t. 17, 18 - as *Dendrobium deplanchei*.

DISTRIBUTION AND ECOLOGY: Endemic to New Caledonia; terrestrial in leaf litter of *Araucaria* and *Nothofagus* montane forest above 750 m.

NOTES: This species is characterised by robust and coarse habit; slightly flattened stems 3-5 m long; leaves to 25 x 3 cm; obovate-lanceolate obtuse sepals to 20 x 8 mm; petals similar but slightly narrower at the base, to 18 x 5 mm; and a slightly spathulate labellum 16 x 5 mm, with prominently incurved margins and a cymbiform apex. The stems sometimes scramble amongst small shrubs or along the ground. The flowers are brown to olive green or pale yellow.

TYPIFICATION: Hallé (1977) believed that the holotype was in Paris but it is in the Reichenbach herbarium at Vienna. Two sheets are annotated as *D. deplanchei* in Reichenbach's hand and from this material it is clear that Reichenbach used both collections when describing the species, although he only cited the Deplanche collection in the protologue. The Deplanche collection (no. 162) consists of a leaf, three flowers in a packet, and a

sketch of the source collection in Paris. The second is a Veillard collection (no. 1327) which consists of a sketch of the collection in Paris, three flowers in a packet and a flattened labellum. Attached at the top right hand corner of the sheet is a card with sketches showing a flower from the side, a side view of the column, anther cap top and underside views and a flattened labellum as well as the original hand written description and citation of both "*Veillard* 1327" and "*Deplanche* 162". The sketch of the flattened labellum corresponds to the material in the packet on the same sheet.

SPECIMENS EXAMINED: New Caledonia; Mé Maoya E, alt. c. 1000 m, 14 Jan. 1970, *Schmid* 3027 (NOU); Mine de Pouvray, N'Goye, alt. c. 700 m, 2 June 1982, *Suprin* 1869 (NOU); Montagne des Sources, sentier à flanc de montagne, alt. c. 900 m, 10 Mar. 1965, *Veillon* 84 (NOU); Montagne de M'bee, 1855-60, *Vieillard* 1327 (W).

5. Cannaeorchis fractiflexum (A. Finet) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium fractiflexum* A. Finet, *Bull. Soc. Bot. France* 50: 377, t. 13, f. 27-39 (1903); *Grastidium fractiflexum* (A. Finet) Rauschert, *Feddes Rep.* 94(7-8): 449 (1983). Type: 'Nouvelle-Caledonie: Baie de Tupiti, sommet des montagnes', 1861-67, M. *Deplanche* 529 (holo P!; iso K!, W!).

Dendrobium fractiflexum A. Finet var. *micranthum* Guillaumin, *Mem. Mus. Nat. Hist., Paris* (ser B) 8(1): 35 (1962). Type: New Caledonia; forest at base of mountains N. of Kouebuni (Goro), alt. c. 120 m, 10 Jan. 1951, *H. Hurlimann* 600 (holo & iso Z!), **syn. nov.**

ILLUSTRATIONS: Finet (1903), t. 13, f. 27-29; Hallé (1977), t. 9, 10 - both as *Dendrobium fractiflexum*.

DISTRIBUTION AND ECOLOGY: Endemic to New Caledonia; terrestrial in wetter areas in more open forest and along creeks in dense rainforest.

NOTES: This species is readily recognised by its long pendent multiflowered (4-12 flowers) inflorescences with a flexuose rachis, and nodding flowers with acute to acuminate segments. The flowers, which are white with pink suffusions, are covered internally with dark brown glandular secretions. The plants, which can grow to more that 2 m tall, also have green sheaths; spreading thick broad light green leaves which are paler on the underside; lamina twisted at the base and forming a flat plane and with a basal abscission layer; abaxial surface with a distinct midrib and six other main veins; acute, obliquely bifid apex; labellum lanceolate, grooved apically; anther lobes channelled; stigma cordate; and rostellum large and plate-like.

A variant has been collected from near Yaté which requires further study. It has crowded flexible narrow dark green leaves which have red margins; a barely discernible red midrib and lateral main veins; acuminate and minutely bifid apex; dark green and red sheaths; a short pendent inflorescence, slightly flexuose in the rachis; nodding white flowers with pink suffusions, internally covered with minute dark brown glandular secretions; and a lanceolate labellum which is sometimes sigmoid.

The variety *micranthum* was distinguished by having smaller flowers (2 cm rather than 3 cm long), but in all other respects it appears identical and the type is very similar to the type of *D. fractiflexum*. Although distinctive, *D. fractiflexum* is variable especially in vegetative morphology and further study of this variation is warranted.

SPECIMENS EXAMINED: cultivated ANBG, 23 Jan 1995 ex New Caledonia; c. 10 km along road to Yaté, 21 Aug. 1992, *Clements* 7838 (CANB 9212973); Kuakue, alt. c. 500 ft, 10 May 1914, *Compton* 897 (BM); below Yaté Dam, alt. 300 m, 9 Nov. 1988, *Cribb s.n.* (K); Col de Plum, 28 Oct. 1979, *Jaffré* 412 (NOU); Prony, alt. c. 150 m, 4 June 1979, *MacKee* 36966 (K); Port Boise, 6 July 1977, *Morat* 5581 (NOU); *loc. cit.*, 6 July 1977, *Morat* 5582 (K); New Caledonia, 1886, *Roberts s.n.* (HBG); cultivated ANBG, 18 Oct. 1996, Mt. Dore Rd, mountain opposite Fontaine du Col de Plum, 8 Nov. 1992, *Ziesing* 97 (CANB 9217766).

6. Cannaeorchis megalorhizum (Kraenzl.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium megalorhizum* Kraenzl., *Viertelj. Naturf. Ges. Zürich* 74: 85 (1929); *Dendrobium sarcochilus* A. Finet var. *megalorhizum* (Kraenzl.) N. Hallé, *Flore de la Nouvelle-Caledonie et Dépendances* 8: 53 (1977); *Grastidium megalorhizum* (Kraenzl.) Rauschert, *Feddes Rep.* 94(7-8): 450 (1983). Type: "Neu-Caledonien: Plateau des Tiebaghi", 16 Mar. 1925, *A.U. Däniker* 1474 (lecto Z!; isolecto Z!, *fide* Hallé 1977).

ILLUSTRATION: None found.

DISTRIBUTION AND ECOLOGY: Endemic to New Caledonia where terrestrial or occasionally epiphytic on the base of shrubs in low maquis scrubland on ferric or serpentine soils.

NOTES: This species is sometimes treated as a variety of *Dendrobium sarcochilus* Finet (Hallé 1977), but the two are readily distinguished by their habit and flowers. *Cannaeorchis megalorhizum* has slender canes, narrow linear-lanceolate leaves with acute apices (10-12 x cm x c. 8-9 mm), a fewer flowered (2-6 flowers) porrect inflorescence and thin convolute raised margins on the labellum mid-lobe. The flowers are dull yellow, the labellum brighter.

SPECIMENS EXAMINED: New Caledonia; Ile Art, secteur Sud, 9 Dec. 1978, *Jaffré* 1634 (NOU); Ile Art. plateau S., 24 Aug. 1978, *Veillon* 3700 (NOU); Mt. Boulinda, alt. c. 500 m, 9 July 1975, *Veillon* 15361 & *Schmid* (NOU); Sommet du douce de la Tiébaghi, alt. c. 600 m, 27 Oct. 1993, *Virot* 1394 (NOU).

7. *Cannaeorchis polycladium* (Rchb.f.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium polycladium* Rchb.f., *Linnaea* 41: 90 (1877); *Grastidium polycladum* (Rchb.f.) Rauschert, *Feddes Rep.* 94(7-8): 452 (1983). Type: 'Nova Caledonia', [Isle of Pines], Aug. 1861, M. *Deplanche* 156 (holo W!; iso P!).

ILLUSTRATION: Hallé (1977), t. 19, 20 - as *Dendrobium polycladium*.

DISTRIBUTION AND ECOLOGY: New Caledonia, southern areas including the Isle of Pines; terrestrial growing in maquis scrubland or forest.

NOTES: This species is characterised by tall habit (canes to 2 m); narrow-lanceolate leaves which are often purple; multiflowered (3-9 flowers) pendulous inflorescence with a straight rachis; acute perianth segments; obscure, short nearly straight mentum; and a white labellum with an ovate, smooth mid-lobe.

Hallé (1977) reduced *D. delumbe* to a synonym of *D. polycladium* but the two are distinct. The type of *D. delumbe* has a pronounced curved mentum, a broadly spathulate labellum and a short two-flowered inflorescence.

The flowers of *C. polycladium* are recorded as greenish white, cream, pale pink or pure white, the labellum lighter or white. Colour changes with age have been observed in cultivated plants from greenish cream with a cream labellum to light pink on the sepals, cream on the inner surface and a white labellum. These changes could account for the range of flower colour reported for this species. Further research is needed on the variation exhibited by this species. In New Caledonia it is commonly referred to as the "White-caned dendrobe" (S. MacCoy, pers. comm.).

TYPIFICATION: The type of *D. polycladium*, which was collected on the Isle of Pines, consists of a stem apex, one inflorescence with three buds, a solitary dissected flower (which may be from an opened bud), a sketch of the original specimen, sketches of a bud, petal, column from the side and labellum from above and the original hand written description. Reichenbach's protologue describes the flower as having a short, obtuse, angular mentum and a ligulate labellum.

SPECIMENS EXAMINED: New Caledonia; Iles des Pins, slopes at summit of Pic Nga, alt. 100-260 m, 5 Aug. 1956, *MacKee* 5045 (K); Plaine des Lacs, NE du Grand Lac, 250 m, 30 Dec. 1978, *MacKee* 36291, 36293 (K, NOU); Plaine des Lacs, SE. de la chute, 4 Dec. 1980, *Suprin* 967 (NOU).

8. *Cannaeorchis sarcochilus* (A. Finet) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium sarcochilus* A. Finet, *Bull. Soc. Bot. France* 50: 376, t. 13, f. 14-26 (1903); Grastidium sarcochilum (A. Finet) Brieger in Schltr., *Die Orchideen* (ed. 3) 1(11-12): 653 (1981). Types: 'Nouvelle-Caledonia: Collines herbeuses a la base de la Table Unio', 1869, M. *Balansa* 2386 (syn P!); 'Nouvelle-Caledonie', *Pancher* 3307 (syn P).

ILLUSTRATIONS: Finet (1903), t. 13, f. 14-26; Hallé (1977), t. 13, 14 - both as *Dendrobium sarcochilus*.

DISTRIBUTION AND ECOLOGY: Endemic to New Caledonia, growing in maquis forest mainly in the south of the main island.

NOTES: This species is characterised by tall habit (canes to 5 m); broadly lanceolate leaves (11-13.5 cm x 12-18 mm) with an obtuse apex; erect multiflowered (5-16 flowers) inflorescence with a straight rachis; obtuse perianth segments; and light yellow flowers with a red markings on the labellum. It is closely allied to *Dendrobium megalorhizum* Kraenzl.

(Hallé 1977) but the two are readily distinquished by their habit.

SPECIMENS EXAMINED: New Caledonia; Vallée de Kouakoue, alt. c. 10-100 m, 11 Nov. 1973, *MacKee* 27785 (NOU); Hte. Ouinne, alt. c. 500 m, 18 Nov. 1976, *MacKee* 32277 (K); Baie de Ouinné, alt. c. 50 m, 27 Dec. 1975, *MacKee* 32530 (NOU); Canala, Me Aiu, alt. c. 700 m, 23 Nov. 1990, *MacKee* 45181 (NOU); Poro, Kaseoua, alt. c. 500 m, 17 Dec. 1992, *MacKee* 46069 (NOU); auf den Hugeln am Ngoye, alt. c. 150 m, 28 Nov. 1902, *Schlechter* 15132 (BM, K).

9. Cannaeorchis steatoglossum (Rchb.f.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium steatoglossum*. Rchb.f., *Linnaea* 41: 88 (1877); *Grastidium steatoglossum* (Rchb.f.) Rauschert, *Feddes Rep.* 94(7-8): 453 (1983). Types: Nova Caledonia, *Vieillard* 1337 (lectotype W!, here designated). Syntype: Nova Caledonia, 1861, *Deplanche* 164 (syn P!).

ILLUSTRATIONS: Hallé (1977), t. 11, 12; Bégaud *et al.* (1995), p. 85 - both as *Dendrobium steatoglossum*.

DISTRIBUTION AND ECOLOGY: New Caledonia; growing in maquis forest mostly in the south of the main island.

NOTES: This species is characterised by tall bamboo-like stems (to 5 m or more); inflorescences of one or two flowers; and small pale yellow or greenish-yellow flowers with a paler labellum.

The stems of this species are unable to support their own weight and bend readily. They are often bare for all but the top 15-25 cm, and as such blend in with the branches of surrounding shrubs and small trees. The insignificant flowers are well hidden amongst the leaves.

This species and *C. verruciferum* commonly inhabit open maquis on exposed areas of ultrabasic soils in the southern part of New Caledonia.

TYPIFICATION: The lectotype is chosen from amongst the syntypes because it represents the main collection in the Reichenbach Herbarium at Vienna, including illustrations of the plant and flower, and the hand written original description of the species.

SPECIMENS EXAMINED: New Caledonia; c. 80 km E. of Noumea on road to Yaté, River Pernod, 6 Dec. 1989, *Clements* 5653 (CANB 8916295); Plaine des Lacs, alt. c. 250 m, 20 Oct. 1914, *Franc* 2009 (BM, K); Haute Kuebini near Lac en Long, alt. c. 150 m, 6 May 1964, *MacKee* 11314 (K); Prony; le Carenage, alt. c. 100 m, 11 Dec. 1977, *MacKee* 34353 (CANB 8908105, K, NOU); Plaine des Lacs, alt. c. 250 m, 30 Dec. 1978, *MacKee* 36283 (K, NOU); Col de Prony, alt. c. 300 m, 4 June 1979, *MacKee* 36960 (K); Plaine des Lacs, NE. of Grand Lac, alt. c. 250 m, 4 June 1979, *MacKee* 36981 (K); Hauteurs de Yaté, alt. c. 250 m, 21 Apr. 1985, *MacKee* 42566 (K); Au SE. de la Chute, Plaine des Lacs, 3 Nov. 1980, *Suprin* 957 (NOU); Plaine des Lacs, Bord du Lac en Y, 14 Mar. 1972, *Veillon* 2536 (NOU); Chutes de la Madeleine, 7 Nov. 1992, *Ziesing* 91 (CANB).

10. Cannaeorchis vandifolium (A. Finet) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium vandaefolium* A. Finet, *Bull. Soc. Bot. France* 50: 375, t. 13, f. 1-13 (1903); *Grastidium vandifolium* (A. Finet) Rauschert, *Feddes Rep.* 94(7-8): 453 (1983). Type: 'Nouvelle-Caledonie: ile Art', June 1871, *Balansa* 3117 (holo & iso P!).

ILLUSTRATIONS: Finet (1903), t. 13, f. 1-13; Hallé (1977), t. 15, 16; Bégaud *et al.* (1995), p. 86 - all as *Dendrobium vandifolium*.

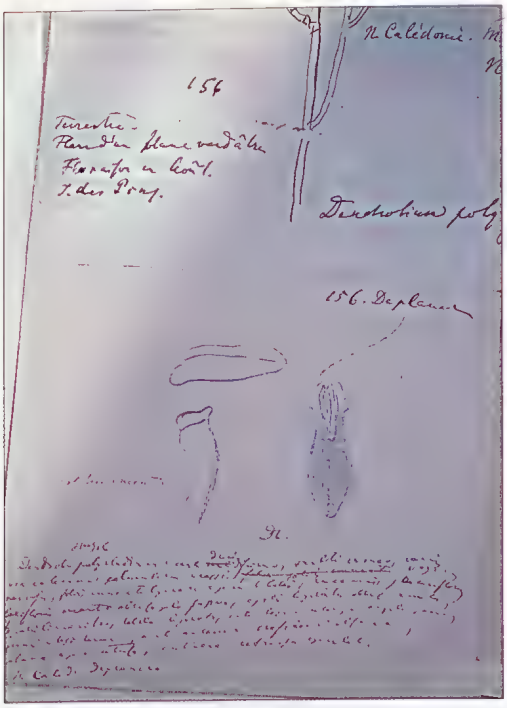
DISTRIBUTION AND ECOLOGY: Endemic to New Caledonia, growing in maquis forest in the north of the main island and on some off-shore islands.

NOTES: This species is characterised by tall habit (to 4 m); crowded, conduplicate, arcuate, ligulate leaves; and multi-flowered (10-40 flowers), drooping inflorescence. The flowers are greenish or pale yellow with a white labellum.

Cannaeorchis vandifolium exhibits a degree of variation which warrants further study. Four variants are apparent from herbarium collections:-

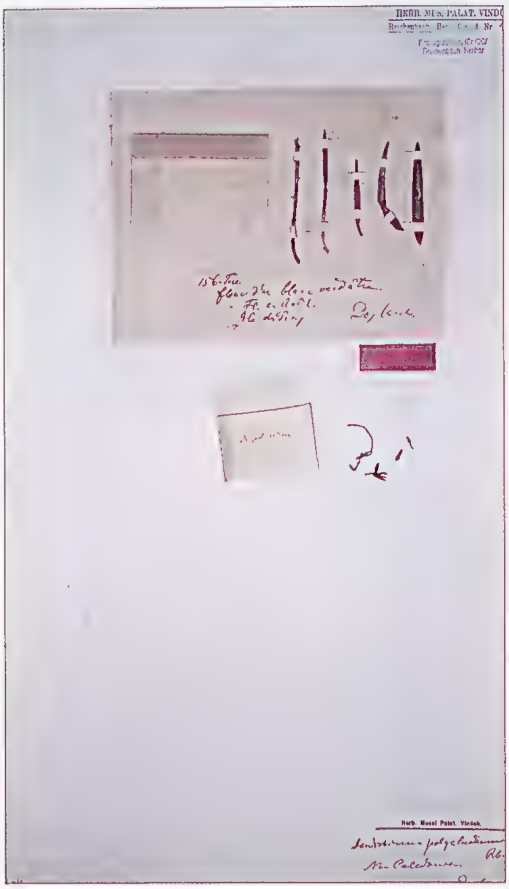
1). The typical variant has relatively thin stems to 2 m tall and c. 7-8 mm diam.; slightly erect leaves, 15-20 cm x 15 mm; inflorescence not thickened basally, with bracts 8-10 cm long; racemes of 10-20 well-spaced flowers on pedicels 15-20 mm long; lanceolate sepals; obliquely lanceolate acute petals; and a spathulate labellum. Detailed illustrations of part of the floral parts are presented in Hallé (1977), t. 16, f. 1,4,5.

2). Plants of this variant have stems 3.5-4 m tall and 8-14.5 mm diam; porrect leaves 10-12 cm x 20-30 mm; inflorescence thickened at the base



15. Part of the holotype of *Dendrobium polycladium* at Vienna (W)

17. Isotype of *Dendrobium deplanchei* at Paris (P)

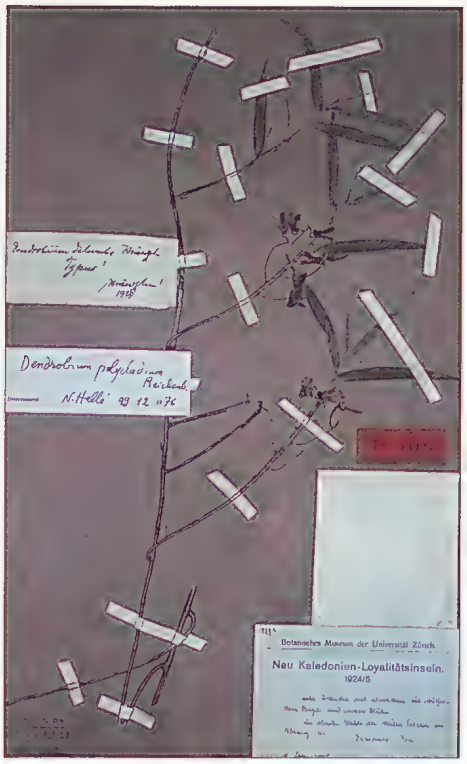


16. Part of the holotype of *Dendrobium polycladium*, at Vienna (W)

18. Holotype of *Dendrobium deplanchei* at Vienna (W)

19. Holotype of *Dendrobium sacrochilus* at Paris (P)

20. Holotype of *Dendrobium megalorhizum* at Zürich (Z)



21. Holotype of *Dendrobium delumbe* at Zürich (Z)

22. Holotype of *Dendrobium fractiflexum* var. *micranthum* at Zürich (Z)

23. Holotype of Dendrobium vandifolium at Paris (P)

24. Holotype of Dendrobium polycladium var. atractoglossum at Paris (P)

with 5-7 basal bracts 8-15 cm long; racemes of 25-40 clustered flowers on pedicels 17-23 mm long; sepals and petals similar to the typical variant; and narrow spathulate labellum. This variant is illustrated in Bégaud *et al.* (1995) and has been collected at Koniambo and Tiébaghi.

3). This variant from relatively low elevations near Koniambo has stems to 1.6 metres tall and 7-9 mm diam.; distinctly drooping leaves, 12-13 cm x 16-18 mm; sparser inflorescence than the typical, 7-17 cm long with one or two basal bracts and one or two stem bracts; racemes of 9-30 slightly larger flowers; triangular acute sepals; narrowly lanceolate petals; and a spathulate labellum with an acute apex.

4). This variant, collected on Mt Kaala, is closest to the type in habit and floral features but with linear petals which are slightly oblique near the apex.

SPECIMENS EXAMINED: New Caledonia; *cit. loc., Hoock s.n.* (NOU); Massif du Koniambo, 1 June 1972, *Jaffré 755* (NOU); *cit. loc.*, alt. c. 200 m, 25 Aug. 1987, *Jaffré 2867* (NOU); Plateau du Dôme de Tiebaghi, alt. c. 500 m, 17 Oct. 1969, *MacKee 21023* (K, NOU); Koumac, Tongadiuo, alt. c. 20 m, 6 Mar. 1972, *MacKee 25145* (K, NOU); Pouembout, Tiea (Pente Ouest), alt. c. 200 m, 25 Feb. 1975, *MacKee 30311* (K); Poya, Nekoro, alt. c. 200 m, 21 May 1977, *MacKee 33200* (NOU); Koumac, Siounda, alt. c. 150 m, 1 July 1982, *MacKee 40595* (K); Poum, alt. c. 350 m, 9 Sep. 1982, *MacKee 40782* (K); Koumac, Chagrin, alt. c. 300 m, 10 Sep. 1982, *MacKee 40799* (K); Plateau de la Tiebaghi, alt. c. 600 m, *Schmid 1483* (NOU); cit. loc., alt. c. 500 m, 17 Oct. 1970, *Schmid 3457* (NOU); Iles de Yande, alt. c. 80 m, 23 Aug. 1978, *Tirel 1240* (K).

11. *Cannaeorchis verruciferum* (Rchb.f.) M.A. Clem. et D.L. Jones, *comb. nov.*

Basionym: *Dendrobium verruciferum* Rchb.f., *Linnaea* 41: 88 (1877). Types: 'Nova Caledonia' Mt. Unia, 1855-60, *Vieillard 1291* (syn W!; isosyn P!); 'Nova Caledonia', 1861, *M. Deplanche 157* (syn W!; isosyn P!).

ILLUSTRATIONS: Hallé (1977), t. 22, 23; Bégaud *et al.* (1995), p. 87 - both as *Dendrobium verruciferum*.

DISTRIBUTION AND ECOLOGY: Endemic to New Caledonia, growing on chromium-rich rock in low maquis forest, mainly in the south of the island, with an outlying population in the north at Poum.

NOTES: This species is characterised by the slender growth habit, solitary (rarely two), porrect flowers, narrow oblong-lanceolate, spreading, red-brown or green tepals, and a thick green or yellowish-green pendent labellum. It often grows on exposed ultrabasic rock formations in full sun and is one of the commonest species in southern New Caledonia.

Plants from the northern isolated population near Poum have broader leaves clustered together near the apex and slightly fleshier flowers. Further study of this northern population appears warranted.

TYPIFICATION: The type sheet in Vienna includes both syntypes with the Deplanche collection being the more complete. Since there is no confusion about the identity of these two collections and each appears to have been used equally in the description of the species, there seems little advantage in selecting a lectotype.

SPECIMENS EXAMINED: New Caledonia; road to Yaté, 11 Dec. 1989, *Clements 5653* (CANB); Presqu' Il Bogota, alt. c. 1500 ft., 25 June 1914, *Compton 1321* (BM); Prony, Mar. 1914, *Franc 1804a* (K); Plaine de Lacs, secteus compement Penamax, 15 July 1974, *Jaffré 1334* (NOU); Golone, région de Poum, 15 Nov. 1976, *Jaffré 1798* (NOU); Poum, Golone, alt. c. 80 m, 14 Apr. 1972, *MacKee 25288* (K, NOU); Vallée de la Ouinne, alt. c. 50 m, 25 May 1974, *MacKee 28703* (K); Yaté, Plateau au sud du Village, alt. c. 300 m, 1 Jan. 1975, *MacKee 29654* (K); Plateau de la Chute, 9 Feb. 1966, *Veillon 633* (NOU); Au SE. de la Rivière des Pirognes au dessus de la Mine Bien-Sûr, alt. c. 200 m, 7 June 1967, *Veillon 1229* (NOU); Plaine de Lacs, environ 1 km aprés le "Tron", alt. c. 150 m, 21 May 1968, *Veillon 1786* (NOU); Chutes de la Madeleine, 7 Nov. 1992, *Ziesing 96* (CANB 9217765).

Excluded species

Dendrobium virotii Guillaumin, *Not. Syst.* 10(2): 59-63 (1941); *Grastidium virotii* (Guillaumin) Rauschert, *Feddes Rep.* 94(7-8): 453 (1983). Type: Nouvell-Caledonie, Monte Boulari, Camp No. 3, Jun 1938, *Virot s.n.* (holo P!).

Notes: This species was treated by Rauschert (1983) as a *Grastidium* as were most species of *Cannaeorchis*. It

is neither a *Grastidium* nor *Canneorchis* and its status is the subject of a separate study.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the support of the Australian Orchid Foundation, the Foundation for the Protection of Wild Orchids, Zürich, the Nell and Hermon Slade Trust and Sir Robert and Lady Sainsbury for financial support to carry out parts of this research. We also sincerely thank the curators of the following herbaria AD, B, BM, BO, BRI, CANB, G, HBG, K, L, MEL, NOU, NSW, P, W, Z who kindly assisted during various visits and loaned type material, Justin Tkatchenko, Curator of the National Capital Botanical Gardens, Port Moresby for assistance and encouragement in this project; Dr. Jaffré, Chef Botanist, O.R.S.T.O.M., Noumea and Monsieur M. Boulet, Le Chef du Service de l'Environnement et de la Gestion des Parcs et Reserves, Province Sud and Monsieur Jean Jacques Villegente during field work in New Caledonia. We also wish to thank Ingeborg Pauluzzi for her generous support while one of us (MAC) was working in Vienna. Thanks also to Mlle Cathy Soucasse, ENSA.M, Montpellier, France for translation of French text. Technical assistance by Maggie Nightingale, Marion Garratt, and Karina FitzGerald is greatly appreciated.

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DIPLOCAULOBIUM OBYRNEI (ORCHIDACEAE), A NEW SPECIES FROM PAPUA NEW GUINEA

by

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ABSTRACT:

Diplocaulobium obyrnei (Orchidaceae: Dendrobiinae), from Misima and the Rigo area, Central Province, is described as a new species.

The genus *Diplocaulobium*, centred on New Guinea, comprises at least 100 species distributed from Malaysia to Fiji with the greatest diversity in Papua New Guinea and Irian Jaya. A review of the genus has been commenced by the author and during this study this prominent species has been selected for formal description. It is grown widely in eastern Australia under several incorrect names, a feature shared by several other *Diplocaulobium* species.

O'Byrne (1992) recognised this species as new, his *Diplocaulobium* species D 1070, and gave a full and complete description (p.196-7 and plate D 1070) pointing out its distinctive growth habit, the very large mentum and the simple labellum. More recently Lavarack (1997) has figured the same species in an article on the genus.

MATERIALS AND METHODS

The description of the new species was made from fresh living plants, spirit preserved specimens stored in BANG mix (65% ethanol, 5% glycerol, and 30% water), floral dissection cards and 35mm color transparencies of flowers and plants.

Diplocaulobium obyrnei W.K.Harris *sp. nov.*

Species nova *Diplocaulobio gracilento* Schltr. affinis pseudobulbis gracilibus fusiformibus, mento profundo, labello simplici oblongo candido apice flavo et carinis duabus rectis elevatis purpureis, ad c. 4-5 millimetris apice attingentibus, differt.

TYPE: cultivated at the Australian National Botanic Gardens, Australian Capital Territory, Canberra, 6 Nov. 1989, *M.A.Clements s.n.* (Holotype CANB 7901448; isotype BRI, CANB, NCBG). PROVENANCE: plant originally collected from Papau New Guinea, Central Province, Rigo area, *Millar s.n.*, 1975.

Epiphytic erect to creeping **herb** c. 10 cm tall. **Rhizomes** short, initially clustered but becoming more distant with age covered with pale brown scarious sheaths. **Pseudobulbs** light green covered in pale brown scarious sheaths when young, fusiform, up to 4 x 0.5 cm at the base, 1.5-2 mm above, unifoliate. **Leaf** erect, stiff, prominently channelled, linear, 8-10 x 0.3-0.4 cm, minutely bilobed at apex. **Inflorescence** terminal, one-flowered. **Floral bract** lanceolate, 0.6-2 cm long. **Flower** with pale yellow-green to cream sepals and petals becoming yellow at the tips with a cream lip with wine red markings on the margins near the centre of the labellum and a two purple keels. **Pedicel and ovary** 4-5 cm long, erect to suberect, ovary not developed at anthesis. **Dorsal sepal** lanceolate, acuminate, 12 x 3 mm wide at base. **Lateral sepals** obliquely triangular, acute, 1.5 x 15 mm at base forming an obtuse mentum with the column-foot. **Petals** filiform with margins in-rolled, 13 x 1 mm. **Labellum** erect for about half of its length and then becoming porrect, oblong 20 x 7 mm, tip yellow, acuminate, the callus with two straight keels terminating c.3 mm from tip. **Column** 2 mm long, porrect from the end of the ovary, with a 15 mm long foot, slightly curved. **Stigma** transversely ovate, c. 0.8 mm across, sunken. **Anther** ovate, c. 1 x 1.5 mm, cream. **Pollinia** obovoid, c. 0.5 mm long, white. **Capsule** not seen. **Fig.1 & Plates 1 and 2.**

FLOWERING PERIOD: Cultivated plants flower sporadically throughout the year. The flowers last

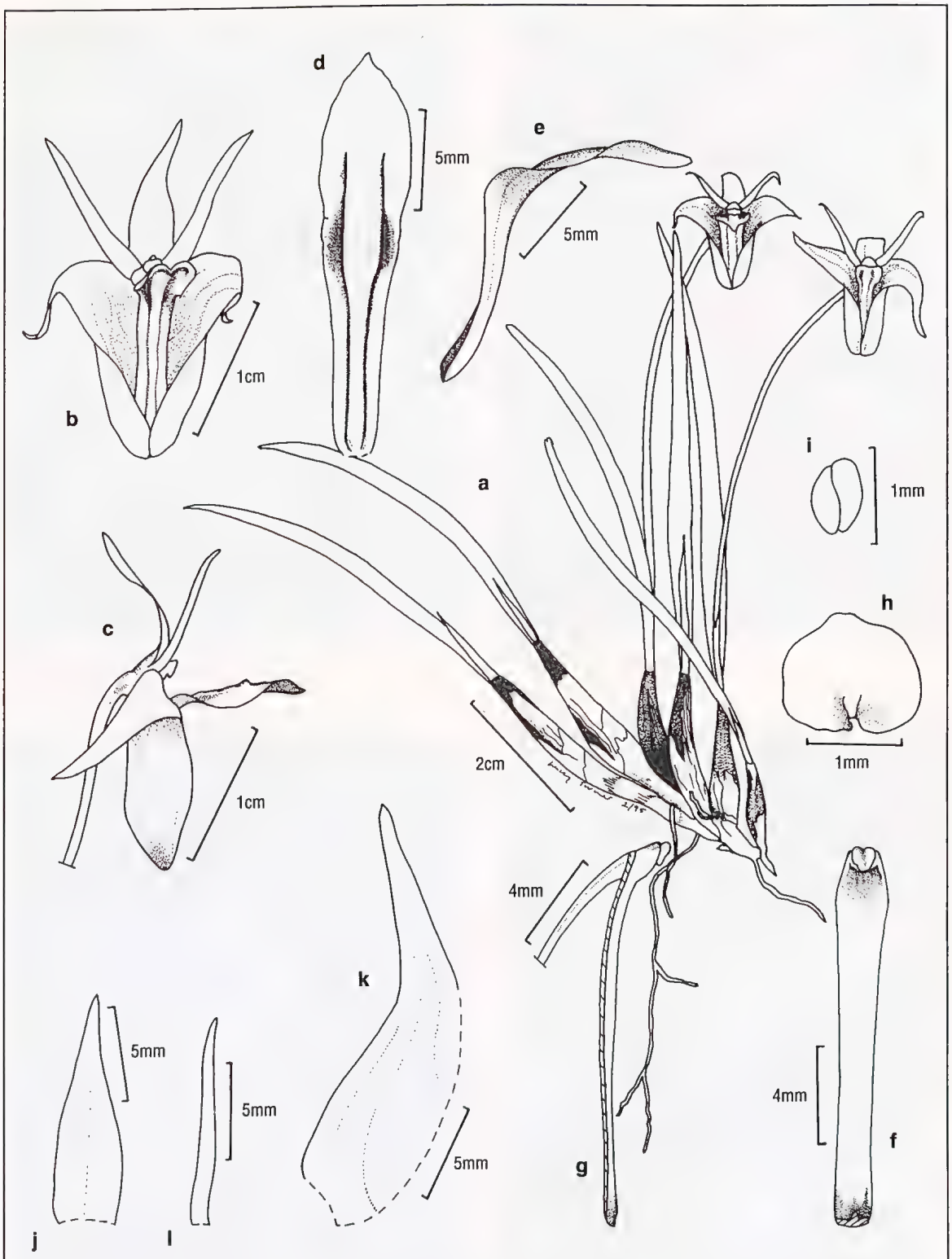

Figure 1. *Diplocaulobium obyrnei*, CANB 7901448: **a.** part of a plant: **b.** flower from the front: **c.** flower from the side: **d.** labellum flattened viewed from above: **e.** labellum from the side: **f.** column from front: **g.** column from side: **h.** anther cap from above: **i.** pollinium: **j.** dorsal sepal: **k.** lateral sepal: **l.** petal.

(Drawing by Lucy Turner)

only one day and do not turn pink as they age.

ILLUSTRATIONS: p.197 and plate D1070. O'Byrne (1992); figure 3, Lavarack (1997).

DISTRIBUTION: Known only from the Rigo area and the Island of Misima, Milne Bay Province (Smedley pers. comm.).

HABITAT: O'Byrne (1992) records the species as 'growing in seasonally dry rainforest overhanging a stream'. On Misima Island the species occurs on the edge of lowland rainforest at c. 300 m. (Smedley pers. comm.).

RECOGNITION: This species is recognised by its erect to creeping habit, the initial pseudobulbs clustered and the later psuedobulbs more distant. The simple labellum, which is erect for about half its length and then porrect is distinctly marked with wine-red on the margins near the centre and with two purple keels.

AFFINITIES: *Diplocaulobium obyrnei* is close to *D. gracilentum* but the latter has a caespitose habit and the flowers are white or pale pink with a shorter, (c. 1 cm), white labellum.

CONSERVATION STATUS: Although this species has only been recorded from two localities in Papua New Guinea it is probably more widespread

ETYMOLOGY: Named after Peter O'Byrne who first informally described this species.

ACKNOWLEDGEMENTS

I would like to thank Mark Clements for his encouragement and support for this project on the revision of the genus and the information on the type specimen. Darryl Smedley provided information and plant material on the Misima Island plants. Peter Bostock (BRI) provided the Latin diagnosis and Lucy Turner the Illustration.

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1A. *Diplocaulobium obyrnei*, cultivated plant, *W.K.Harris* 092 (BRI): flower from front

1B. Side view of flower.

1D. Flower from underside.

1C. Habit of plant.

2A. The plant of *Diplocaulobium obyrnei* from which the type specimen was collected.

2B. Close up of the flower of the type.

NOTES ON SELECTED SPECIES OF DENDROBIUM SECT. LATOURIA

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ABSTRACT:

Composite computer scans generated from pressed material of eight species of *Dendrobium* sect. *Latouria* from New Guinea, viz *Dendrobium alexandrae* Schltr., *D. amphigenyum* Ridl., *D. convolutum* Rolfe, *D. dendrocolloides* J.J. Smith, *D. engae* T.M. Reeve, *D. geotropum* T.M. Reeve, *D. uncipes* J.J.Smith and *D. spectabile* (Blume) Miq. are provided together with detailed descriptions and notes on their ecology and cultivation.

Dendrobium Sw. sect. *Latouria* (Blume) Miq. contains about fifty species (Cribb 1983). Schlechter (1911-14, 1928) described and illustrated a number of species from German New Guinea and repeatedly noted their potential as horticultural subjects. Many species are popular in cultivation but orchid growers find difficulty in identifying all but the most common species. A simple reference publication to help horticulturalists and hybridisers to identify species would be useful. This publication is the first of a series of papers aimed at filling that gap and will be followed by a book on the subject.

Since 1965 the author has maintained about 30 species of *Dendrobium* sect. *Latouria* in cultivation in Sydney, Australia. During this period the differences and similarities between these species have been observed when grown under relatively uniform cultural conditions. Most of these species have also been propagated from seed. Hybrids have been made between species, within the section and with species from other sections of *Dendrobium*, with the aim of producing plants with potential as cut flowers and for the pot plant trade, as well as for the exhibition tables at orchid societies functions. The horticultural potential of this group of orchids is only just being realised.

In preparation for a forthcoming publication on *Dendrobium* sect. *Latouria*, aimed at making it easier to identify the various species, data is being gathered on all species available to the author. The purpose of this paper is to outline this work and the format which will be used in this publication with eight species as examples, viz *Dendrobium alexandrae* Schltr., *D. amphigenyum* Ridl., *D. convolutum* Rolfe, *D. dendrocolloides* J.J. Smith, *D. engae* T.M. Reeve, *D. geotropum* T.M. Reeve, *D. uncipes* J.J.Smith and *D. spectabile* (Blume) Miq.

METHODS AND MATERIALS

The images were created by use of the following technique. A fresh flower was removed and dissected using a fine point scalpel to cut around the column, removing the sepals, petals and labellum, and the column and ovary cut in half lengthwise. A second flower was prepared by removing the labellum and the ovary but, leaving the column intact. A median longitudinal section was made through a third flower. All floral segments were then placed in a small press between sheets of ridged absorbent white card and gradually flattened. Once flattened the specimens were removed and glued in position on 15 x 10 cm cards, of 2 ply Rising Museum Mounting board (RM020 Warm White, 100% cotton, acid free formulation, buffered with calcium carbonate).

The completed cards were placed onto a flat bed scanner (Relisys™) image scanner model Avec Colour 2400) and scanned into an IBM® compatible through Microsoft® Windows™ and Adobe Photoshop™ software. Photographs were scanned in using the same method. Line drawings showing plant habit were scanned into Adobe Photoshop™ using Grey scale settings which is converted to R.B.G settings once a file is generated. Images of floral segments are transferred to this file by cutting, pasting and then arranged around the drawing. The text added through the Adobe program. A few small adjustments were made (such as removing any stray marks and sharpening of the

edges) and the final image printed on a colour printer (Hewlett Packard Deskjet 600™).

Species descriptions are either translations from Latin or an english text of the species prepared by Schlechter (1911-14), Smith (1909, 1912, 1913), Betts (1979), Reeve (1979a, b, 1983), Cribb (1983) and modified from observations made on cultivated plants.

SPECIES

1. **Dendrobium alexandrae** Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 1: 493 (1912); *Latourorchis alexandrae* (Schltr.) Brieger in Schltr., *Die Orchideen* (ed. 3) 1(11-12): 727 (1981): *Sayeria alexandrae* (Schltr.) Rauschert, *Feddes Rep.* 94(7-8): 466 (1983). Type: Kaiser-Wilhelms-Land [Papua New Guinea]: on trees in the mountain forests near Gobi in the Waria Valley, alt. c. 900-1100 m, June 1909, *R. Schlechter* 19857 (holo B†). **See Fig. 1. Plates 3C, D.**

Erect, robust, epiphyte, 50-70 cm high. **Rhizome** very short. **Roots** thread-like, elongated, glabrous. **Pseudobulbs** stem-like from an attenuated base, gradually increasing from 0.4 to 1.5 cm diam. towards the apex, furrowed. **Leaves** 3-4, spreading at 45°, elliptic-acuminate, cuneate at the base, 11-16 cm long, 3.5-5.5 cm wide, glabrous, coriaceous. Inflorescence solitary towards the apex of the pseudobulbs, to 25 cm long, almost erect, loosely 3-7 flowered; peduncle almost equal in length to the leaves; bracts spreading at about 45°, lanceolate, acute. **Flowers** spreading at c. 45°, showy, among the largest in the genus. **Ovary** cylindrical, lightly 6-ribbed; pedicel glabrous, c. 1.8 cm long. **Sepals** lanceolate, long-acuminate, about 5 cm long, the laterals oblique, falcate, forming with the enlarged base of the anterior margin, together with the column foot an obtuse, broadly conical mentum about 1.3 cm. **Petals** spreading obliquely, lanceolate, conspicuously undulate, similar in length to the sepals. **Labellum** cuneate, as long as the petals, about 3 cm wide between the tips of the lateral lobes when flattened; lateral lobes erect and clasping the column, the outer margin square, somewhat crenulate, c. 1.2 cm wide; mid-lobe ovate, acuminate, c. 3.7 cm long, c. 2 cm wide, with an erect, cuneate 3-ridged callus. **Column** short, moderately thick, with 3-lobed clinandrium, with very small falcate, obtuse lateral lobules, the slightly curved dorsal lobe somewhat larger; foot embellished at the tip with a triangular hollow. **Anther** 4-hooded, truncate in front, glabrous.

DISTRIBUTION: Papua New Guinea. Central Province: Rego District; West Sepik Province: Wawa; Morobe Province: Gobi, in the Waria Valley.

HABITAT: Epiphytic in montane forests at c. 900-1100 metres.

NOTES: *Dendrobium alexandrae* was named by Schlechter in honour of his wife Alexandra, nee Sobennikoff (Schlechter 1911-14) who helped him compile his work "*Die Orchidaceen von Deutsch-Neu-Guinea*". For more than 70 years *D. alexendrae* was lost and was even thought by some authors such as Cribb (1983) to be a natural hybrid.

Dendrobium alexendrae was first brought to the author's attention in 1979 by M. Simmons who lived in Port Moresby Papua New Guinea. He had received a plant from Frank Genarti, former Assistant Director of the National Capital Botanical Gardens (NCBG), collected along Border Road and brought into Wawa in the West Sepik Province sometime during 1978. In February 1995 Justin Tkatchenko, Curator of the NCBG, acquired 30 plants of this species from a villager who collected them in the Rego district, Central Province. It was later confirmed that this species is common at this locality.

This species is similar to *D. spectabile* but has larger, more attractive flowers with wider segments. The sepals and petals are yellowish with red spots and the labellum marked with purple spots and stripes.

CULTIVATION: I grow this species in a shallow well-drained plastic pot in a potting medium of pine bark, well soaked to leach out all the resins and tannins. The plants are established by first keeping the roots moist by packing sphagnum moss around the surface of the potting medium. Once established, this moss is removed reducing the watering till the bark is only just moist. I find this species does best in the heated glasshouse, hanging where there is a lot of air movement. Once established. *D. alexandrae* will quickly grow into a specimen plant. Back-cutting old pseudobulbs from the plant helps to accelerate new growth and development into a large plant. Inflorescences are produced from the apex and also from nodes under the leaves. Flowering is in early autumn.

2. **Dendrobium amphigenyum** Ridl., *Trans. Linn. Soc. Bot.* 9: 176 (1916); *Sayeria amphigenia* (Ridl.) Rauschert, *Feddes Rep.* 94 (7-8): 446 (1983). Type: Dutch New Guinea [Irian Jaya], Camp V1a, 3100 ft., *Boden Kloss s.n.* (holo BM). **See Fig. 2.**

Erect epiphytic, lithophytic or terrestrial herb. **Pseudobulbs** cylindrical or slightly dilated above, 3-8-noded below leaves, 12-4 x 1.2-0.8 cm, orange-yellow when dry. **Leaves** 2-3, coriaceous, suberect, lanceolate, acuminate, 9.3-12 x 3.4-2.5 cm. **Inflorescences** terminal, subterminal or from uppermost nodes, suberect 6-8 cm long, 2-9 flowered; bracts falcate, lanceolate, acute, 0.5-0.6 cm long. **Flowers** small, fleshy, the sepals and petals creamy to green, mottled with purple, the labellum purplish; pedicel and ovary 1.7-2.2 cm. **Dorsal sepal** elliptic, obtuse, 1.0-1.2 x 0.5-0.65 cm; **Lateral sepals** very obliquely elliptic, obtuse, 0.9 x 0.9 cm, the mentum subsaccate, 0.5-0.7 cm long. **Petals** falcate, oblanceolate, obtuse, 0.6 x 0.2 cm, wide, margins, erose. **Labellum** strongly recurved at the base, 1.2-0.7 x1-0.7 cm; lateral-lobes erect, oblong-elliptic, rounded at apex, margins erose; mid-lobe smaller than lateral-lobes, deeply emarginate with a mucro in the sinus, each lobule acute or subacute; callus fleshy, 3-ridged with a lower rugulose apex; **Column** 0.2 cm long; foot incurved, 0.5-0.7 cm long.

DISTRIBUTION: Papua New Guinea. Chimbu Province; Southern Highlands Province: Mt Ambua, Tari, and Kotuni; Eastern Highlands Province: Goroka.

HABITAT: Epiphytic and terrestrial in moss forests; terrestrial on clay road batters. Grows on the upper side of branches within the middle canopy. Altitude. 1600-2300 metres.

NOTES: *Dendrobium amphigenyum* belongs to a group of species (including *D. dendrocolloides* J.J. Smith and *D. uncipes* J.J. Smith) where the flower spikes take several months to develop and the buds are figure of eight-shaped when viewed from the side. Plants of this species can be confused with *D. dendrocolloides* J.J. Smith but when in flower are distinguished by having a labellum in which the mid-lobe is not quite as long as the lateral-lobes. The flowers are a light green to brown green with a rose hue on the back. The labellum can be purplish, light yellow to a light green and some times almost white. The flowers last for at least two months.

CULTIVATION: Plants thrive in an open bush house with a temperature range of 2°-35°C throughout the year. They are potted in pine bark which has a light moss covering on the bark, pots are hung rather than sitting on a bench and watered daily, early in the morning. Capsules should not be harvested for at least six months after pollination.

3. **Dendrobium convolutum** Rolfe, *Kew Bull.* 1906: 375 (1906); *Sayeria convoluta* (Rolfe) Rauschert, *Feddes Rep.* 94(7-8): 466 (1983). Type: cultivated, *Sander & Sons s.n.* ex New Guinea. (holo K). **See Fig. 3. Plate 2A.**

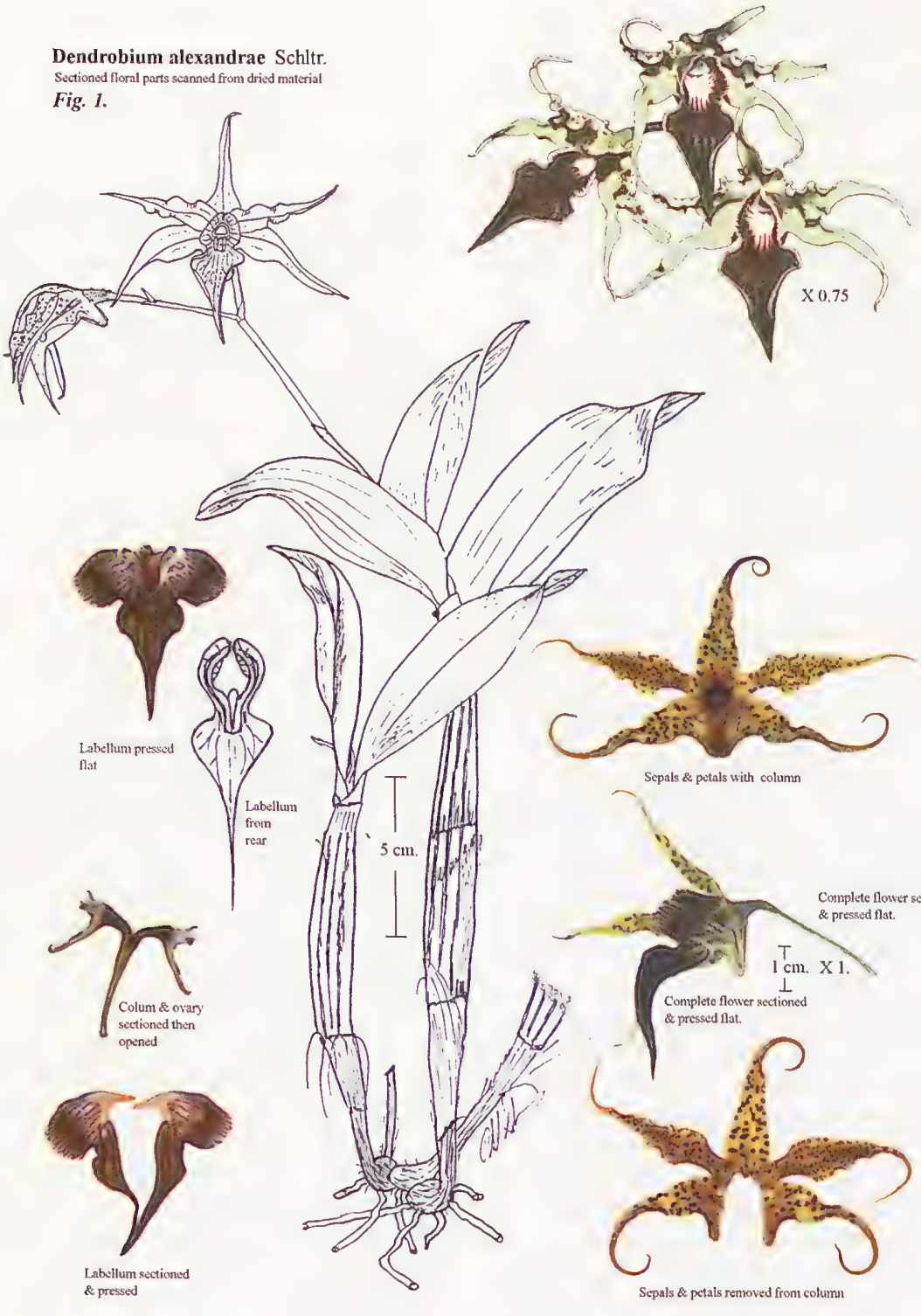
Erect tufted epiphyte. **Pseudobulbs** crowded, to 30 cm long, somewhat fusiform, furrowed, 1.3 cm diam. near the middle and 0.4 cm diam. at the fourth sheathing bract from the rhizome. **Leaves** broadly ovate-lanceolate, 2-3 crowded near the apex of the pseudobulb, 5.0 x 13.5 cm, ovate, rather thin. **Racemes** 10-12 cm long, 0.15-0.2 cm diam.; peduncle much longer than the rachis; each pseudobulb often flowers over several years in succession with 1-3 racemes. **Flowers** 2-7, spaced evenly, glabrous, 3.0-3.5 cm diam., with a straight, broad mentum which has a small apical broad hook; sepals and petals bright green with small black/purple markings on edges of ribs in petals and at the junction with the column and labellum; **labellum** a rich black/purple edged green, its lateral-lobes veined with green. **Dorsal sepal** 1.6 x 0.8 cm, lanceolate. **Lateral sepals** 1.5 x 0.8 cm, lanceolate, triangular, curved downwards. Petals 1.4 x 0.5 cm, lanceolate. **Labellum** three-lobed, 1.6 x 1.7 cm; lateral lobes 0.5 x 0.8 cm, broadly clavate, obtuse; mid-lobe transversely oblong-reniform, apiculate; calli extremely prominent, 0.3 x 0.1 cm, acuminate, ridged, 0.3 cm high.

HABITAT AND ECOLOGY: Epiphytic in coastal rainforests.

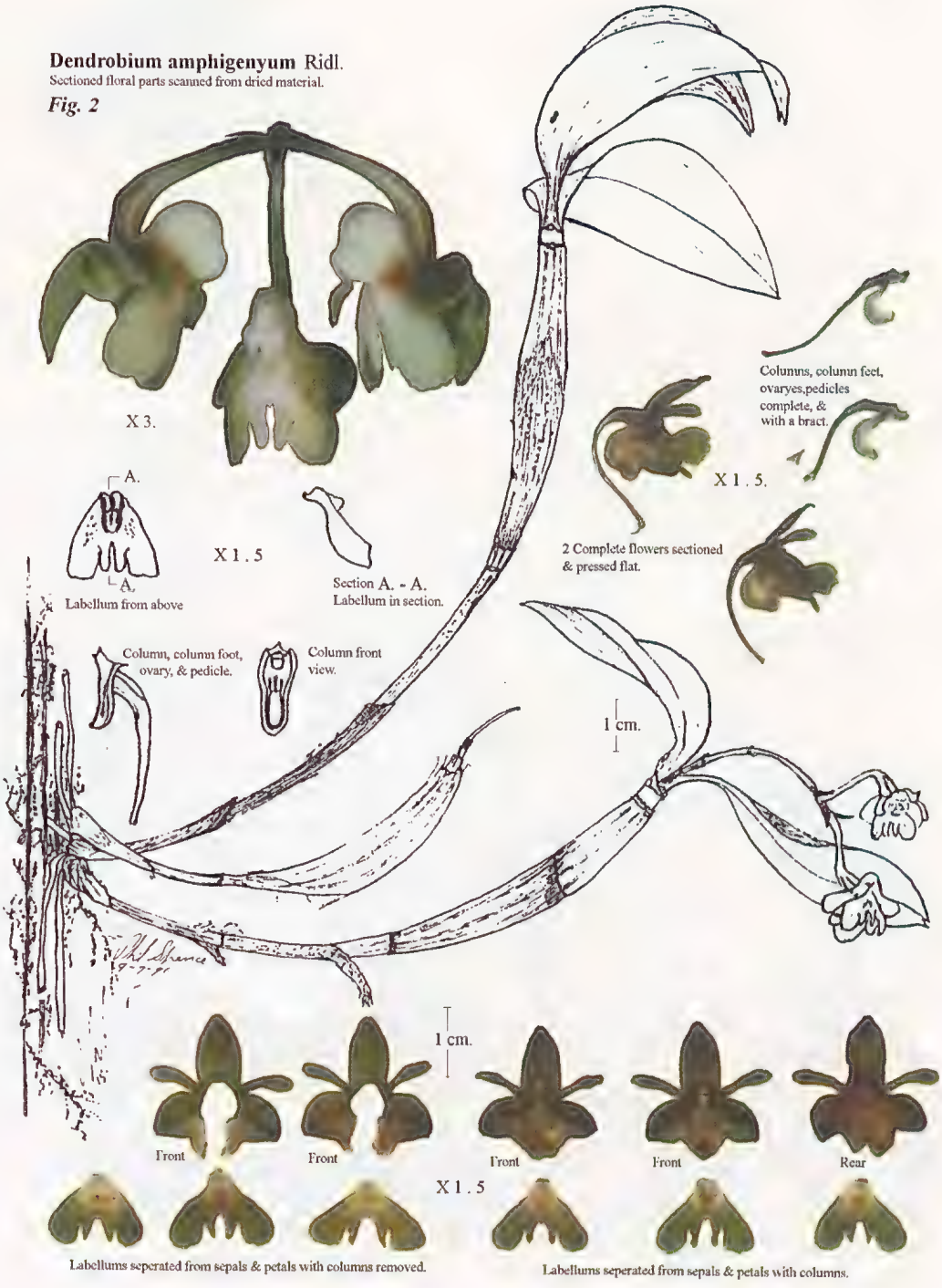
DISTRIBUTION: Papua New Guinea. Madang Province: Madang; Morobe Province: Finschhafen; Milne Bay Province: Milne Bay.

NOTES: Very little is known about the natural habitat of this species. It was described from a plant found in one of Sander's collections of *D. atroviolaceum* from British New Guinea (Rolfe 1906, Reeve 1979a). Mrs. Andreé Millar brought this species to

Dendrobium alexandrae Schltr.
Sectioned floral parts scanned from dried material
Fig. 1.



Dendrobium amphigenyum Ridl.
Sectioned floral parts scanned from dried material.
Fig. 2



my attention in Port Morseby in 1976 by a collection from Finschhafen of seven plants, two of which were pressed and deposited at Lae. I was fortunate to be able to raise this rediscovered species from seed. From these plants, seedlings are now available around the world. The rediscovery of this species and its subsequent reintroduction into cultivation by the author was reported more fully by Betts (1979). Recently more collections of this species have been made in the Finschhafen area.

The plant used to compile this description was collected near Finschhafen by A. Ninjio of Lae about 1973 (Millar 1973).

CULTIVATION: *Dendrobium convolutum* grows very easily in warm climates and in unheated glass houses, in pots of medium bark with polystyrene beads in the bottom of the pot. Plants are hung in the bushhouse under fibreglass for 9 months of the year and in the colder months transferred to a glasshouse after flowering in autumn. This species can tolerate occasional cool nights down to 6°C. The flowers last from four to six months.

Dendrobium convolutum has been used to make many beautiful hybrids. The first to flower was a cross with *D. atroviolaceum*, a very closely related section Latouria species. This hybrid I named *D.'Andreé Millar'*. Another very impressive hybrid is *D. convolutum x D. engae* which I named *D.'Gerald Mc Craith'*. In nearly all the *D. convolutum* hybrids the green tepal colouration seems to be a dominanting influence in the progeny and the labellum colour and shape is also enhanced, with much finer stripes than in the parent and generally flatter and more open.

4. **Dendrobium dendrocolloides** J. J. Smith, *Repert. Spec. Nov. Regni Veg.* 12: 110 (1913) & *Nova Guinea* 12(4): 320 (1916); *Sayeria dendrocolloides* (J. J. Smith) Rauschert, *Feddes Rep.* 94 (7-8): 466 (1983). Type: Dutch New-Guinea [Irian Jaya]: Arfak Mountains, alt. c. 2500 m, *K. Gjellerup* 1193 (holo BO). **See Fig. 4.**

Epiphytic herb. **Pseudobubs** clustered, clavate or subclavate, angled, with 2-6-nodes below the leaves, 5.5-34 x 0.4-0.95 cm, green-brown, or orange when old. **Leaves** 2-3, coriaceous, elliptic-lanceolate or lanceolate, acute, 5-9.8 x 3.8-2.6 cm, very shortly petiolate. **Inflorescence** terminal or subterminal, arcuate to suberect, 5-7.5 cm, long, up to 10-flowered; bracts elliptic, acute, 0.35-0.5 cm long. **Flower** small, fleshy; sepals and petals white or greenish to red-greenish ± flushed with purple; **labellum** with green lateral-lobes and a purplish mid-lobe with a white base; **column** greenish white. **Dorsal sepal** oblong-elliptic, obtuse, 0.5-0.9 x 0.3-0.6 cm. **Lateral sepals** very obliquely oblong-elliptic, wider than long, obtuse, 0.5-0.7 x 0.6-0.8 cm; mentum subglobose, 0.5-0.7 cm, long. **Petals** falcately linear, rounded at apex, 0.45-0.8 x 0.15-0.2 cm. **Labellum** flabellate in outline from a narrow base, 0.45-0.85 x 0.55-0.9 cm, deeply emarginate with a small mucro in sinus, front margins erose; callus fleshy, obscurely 3-ridged. **Column** 0.25 cm long, with erose apical margins; foot 0.5-0.7 cm long.

DISTRIBUTION: Indonesia. Irian Jaya. Papua New Guinea. Morobe Province (Cribb 1983); Enga Province.

HABITAT: Epiphyte in montane forests or terrestrial on exposed earthern banks. Altitude1130-1800 metres. Plants I observed in the wild were growing in clay embankments or in sphagnum moss tufts on exposed hill tops. The best plants were in thick alpine moss forests on the upper side of branches in the middle canopy.

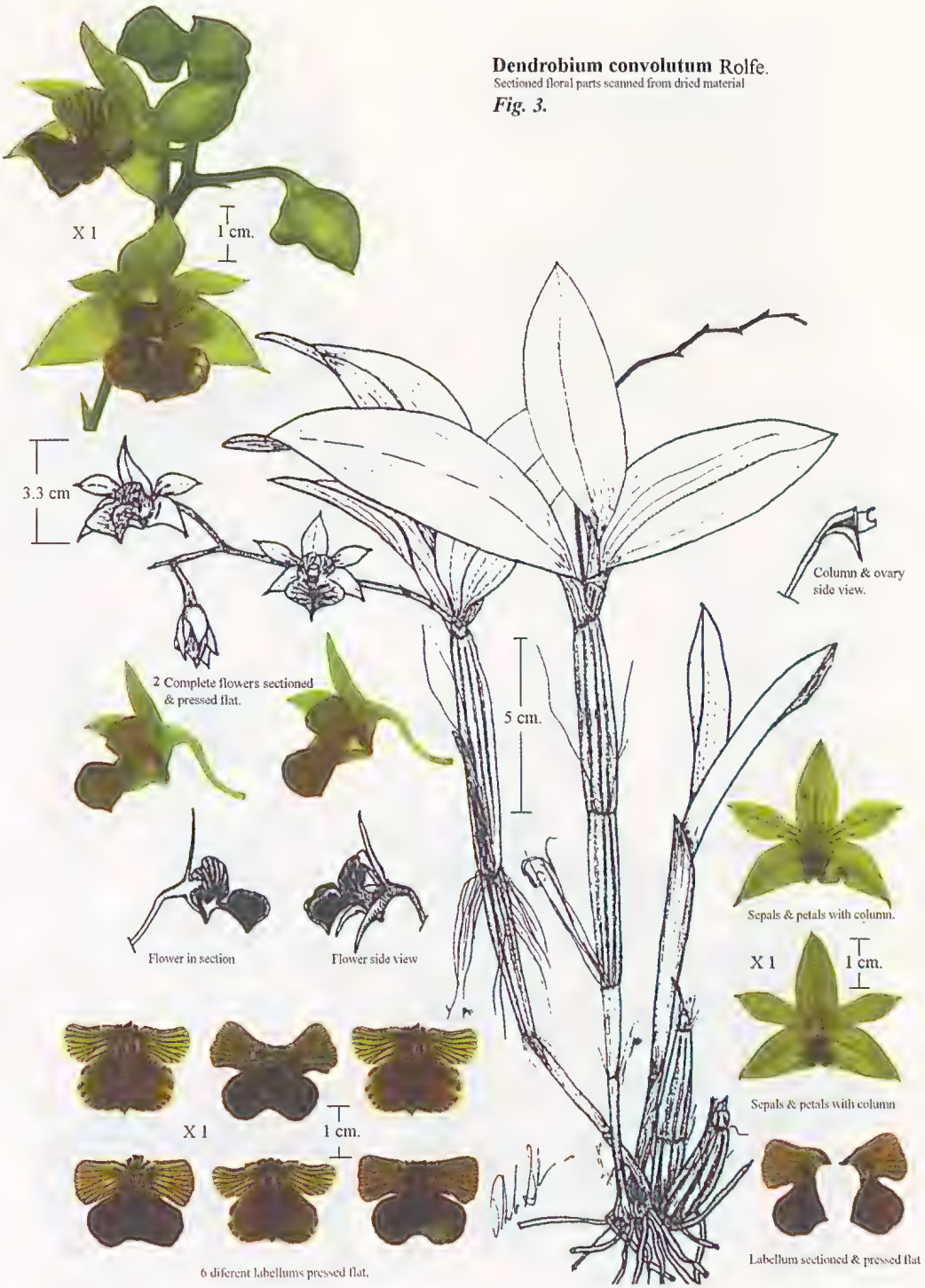
NOTES: This species is often confused with *D. amphigenyum* which it closely resembles in habit and flower size, and they are often found growing in the same locality. The flowers of *D. dendrocolloides* usually self pollinate without opening and the labellum is 2-lobed with the mid-lobe reduced to a small sinus between the lobes.

CULTIVATION: This species thrives in an open bush house with a temperature range of 2°-35°C throughout the year and is potted in pine bark which has a light moss covering. Plants hang and are watered daily, early in the morning. Flowers last for two or more months. It is important to watch the new growths as they have a tendency to tunnel into the mix and eventually rot. Left unchecked this situation has the potential to kill the plant at the forward growth.

5. **Dendrobium engae** T. M. Reeve, *Orchadian* 6(6): 123-25, f (1979). Type: Papua New Guinea, Enga Province, Ipai, Laiagam., alt. c. 2200m, Oct. 1978, *T. M. Reeve* 238 (holo LAE; iso AMES, K). **See Fig. 5.**

Robust epiphytic herb to 60 cm tall. **Rhizome**

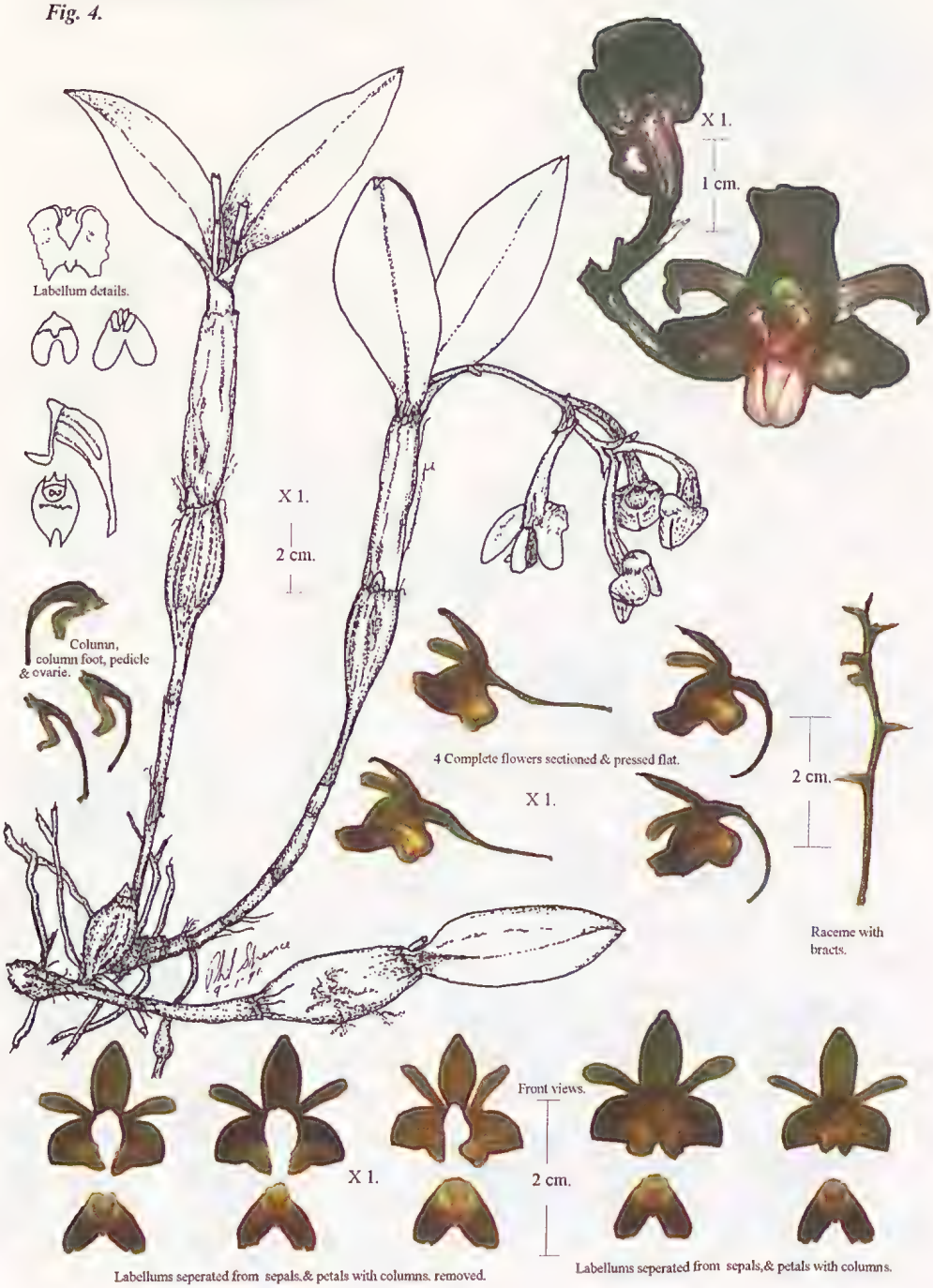
Dendrobium convolutum Rolfe.
Sectioned floral parts scanned from dried material
Fig. 3.



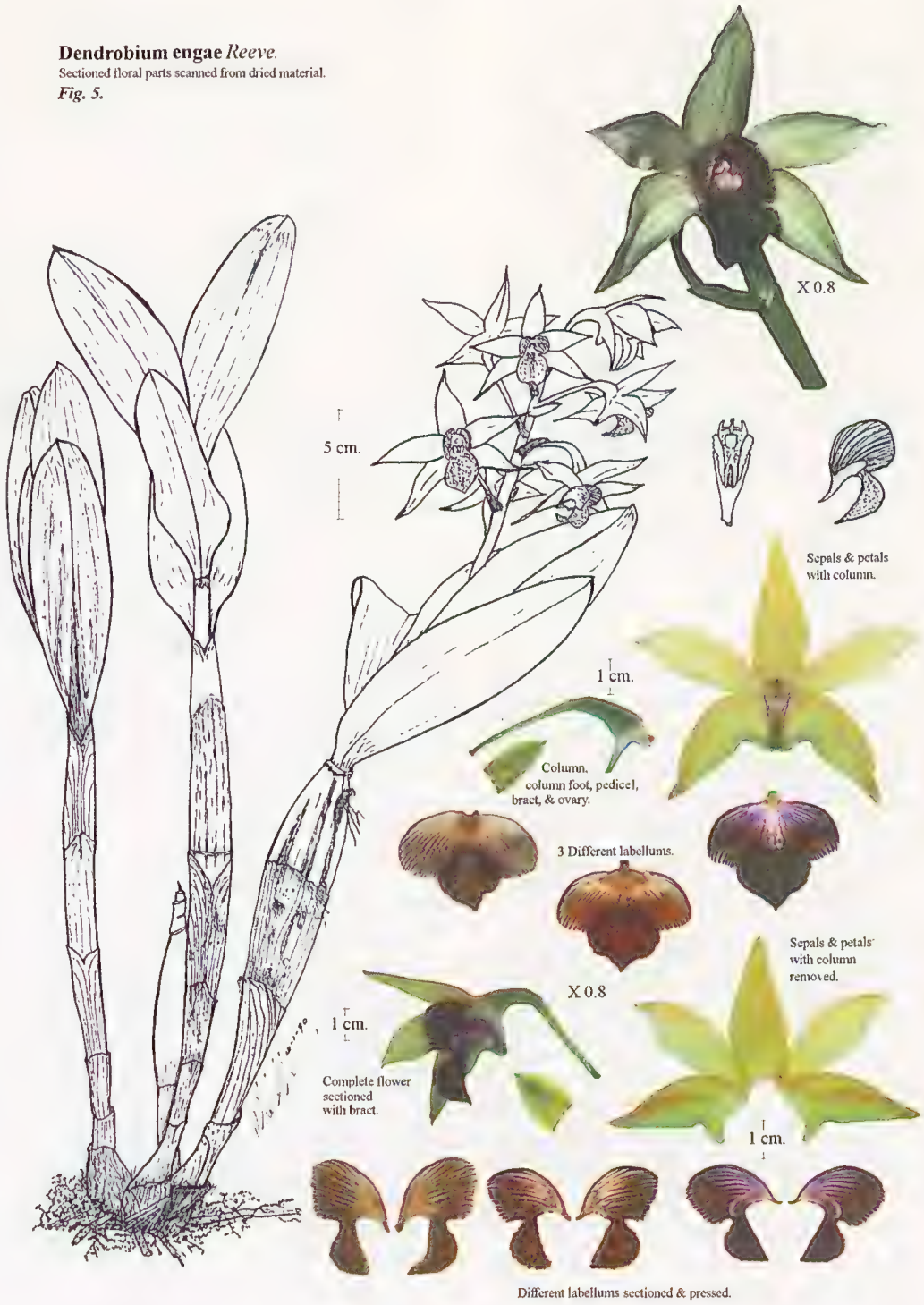
Dendrobium dendrocolloides J. J. Smith.

Sectioned floral parts scanned from pressed material.

Fig. 4.



Dendrobium engae *Reeve.*
Sectioned floral parts scanned from dried material.
Fig. 5.



extremely short. **Roots** thick, flexuous, roughened, 0.2-0.4 cm diameter. **Pseudobulbs** thick, slightly swollen at the base, fusiform (small plants have ovoid pseudobulbs), becoming grooved with age, yellowish, with 10 nodes, 3-50 x 1.9-3.3 cm. **Leaves** 3-5, erect to semi-erect, oblong-ovate to oblong-elliptic, acute, sometimes emarginate, glabrous, leathery, pale to mid green, 5.5-21 x 2.5-6 cm. **Inflorescences** apparently terminal or subterminal, 3-15-flowered; peduncle 4-9 cm long; rachis 4-13 cm, long. **Bracts** ovate, acuminate, c. 1.5 cm long. **Flowers** large, fleshy, glabrous, widely-opening, c. 5-6 cm diameter, strongly and sweetly scented; sepals creamy-white, petals greenish-white, becoming creamy yellow with age. **Ovary** thick, fleshy, glabrous, 6-grooved; ovary with pedicel ca. 4.7 cm long. **Dorsal sepal** ovate-triangular, acute, 4.0-4.5 x 1.7 cm. **Lateral sepals** obliquely ovate-triangular, falcate, acuminate, strongly keeled, 3.8 4.1 x 1.6 cm, basally adnate with the column-foot for 1.0 cm. Petals obovate - spathulate, acute, 3.7-4.5 x 1.6-1.7 cm. **Labellum** stiff, with a prominent 3-keeled white median callus; flattened measurements 3.8-4.5 x 3.5-3.8 cm; lateral lobes erect surrounding the column, oblique-oblong, obtuse, pale yellow-brown with distinct interior purple striations and some small dots on the outside, 1.7-2.0 x 1.2-1.5 cm; mid-lobe projecting forward and downward, rotund to reniform, acute to apiculate, greenish-yellow with many scattered purple dots, becoming yellower with age, 1.8-2.0 cm in diameter. **Column** white with purple dots, c. 0.6 cm long; column-foot c. 1.0 cm long.

DISTRIBUTION: Papua New Guinea. Central Province: Myola, Owen Stanley Range; Mt Obree; Eastern Highlands Province; Enga Province: Wabag; Morobe Province: South of the Wau Bulolo Valley; Northern Province: Kuper Range; Western Highlands Province.

HABITAT: Epiphytic or lithophytic in montane forests and exposed ridges (1800-2700 metres). The main host seems to be *Nothofagus sp.*, but I have also have found plants growing in clay and limestone shale road batters.

NOTES: Named after the Enga Province from where the type was collected (Reeve 1979b), *D. engae* grows as an erect epiphyte on the top side of the upper branches of trees and occasionally also on the main trunk. The dark brown roots with their bright green tips furrow through the very thin scaley type bark barely hidden from sight. Small amounts of moss and algae grow over the poorer drained surfaces of the root systems and tree boughs.

Dendrobium engae was originally known as "Pike's Special" after Dr. Pike who was an observant amateur collector and medical officer in Wabag, in the Western Highlands during the 1960's (Slade 1962).

Dendrobium engae is among one of the more spectacular section *Latouria* dendrobiums and I find it hard to believe that early botanists such as Rudolf Schlechter missed this fabulous species. The substance, the texture, the perfume which these light yellow to green coloured flowers with their red-brown veined labellum, can only impress anyone who views this species. Flowers last from one to two months. This species holds its flowers upwards to slightly nodding on a strong erect spike.

CULTIVATION: I have found this species needs a lot of light and air movement. I use a raft made of fine tree fibre or a potting medium of twelve millimetre bark with sphagnum moss and perlite. The roots should be kept cool and moist, especially during the period when the plant is making new growths which is normally autumn through to spring. In the middle of winter my bush house drops to 1°-2°C. I have encountered no problems in cultivating *D. engae* with temperatures this low.

This species is very difficult to grow from seed. Many people have tried, (including myself) many times with little or no success and much frustration. However, I have found that if a seed capsule is set by self pollinating, good capsules develop with a large amounts of seed produced for sowing. While protocorms quickly develop, it is very difficult to take these protocorms any further regardless of what one tries. Most go brown and die. I was just about to give up when I decided to cross a plant from Myola with a plant from Wabag. The resulting seeds were very easy to grow in vitro and they continued to develop rapidly into seedlings.

I have produced many hybrids from *D. engae*, mainly using the Wabag plants as parents, because they come from a higher altitude (2700 metres) and so grow under much colder conditions. These

cooler growing clones have thus produced hybrids which are more resistant to lower temperatures. Some of these hybrids were with other *Latouria* species (*D. convolutum, D. tapiniense, D. rhodostictum*), others with the section *Spatulata* (*D. conanthum, D. helix, D. stratiotes,*) and a few with species from section *Phalaenanthe* (*D. phalaenopsis, D. lithocola, D. bigibbum, D. affine*). Further to this, a hybrid has been registered (Greatwood 1987) with the section *Nigro-hirsute* (*D. engae* x *D. infundibulum* = *D. Lady Murielle*). *Dendrobium engae* is very interesting for the hybridiser and from my observations should be used extensively in producing cool growing hybrids. Fortunately, there have been no difficulties raising seed with any hybrids I have made. Many of the hybrids produce a strong sweet perfume.

6. **Dendrobium geotropum** T.M. Reeve, *Orchadian* 7(8): 183-185 (1983). Type: Papua New Guinea, Western Highlands Province, Tambul District, Tomba, alt. 2700-2850 m, Feb. 1983, *T.M. Reeve* 1044 (holo LAE; iso AMES, CANB, E, K, L, NSW).

See Fig. 6. Plates 1A-D, 3A, B.

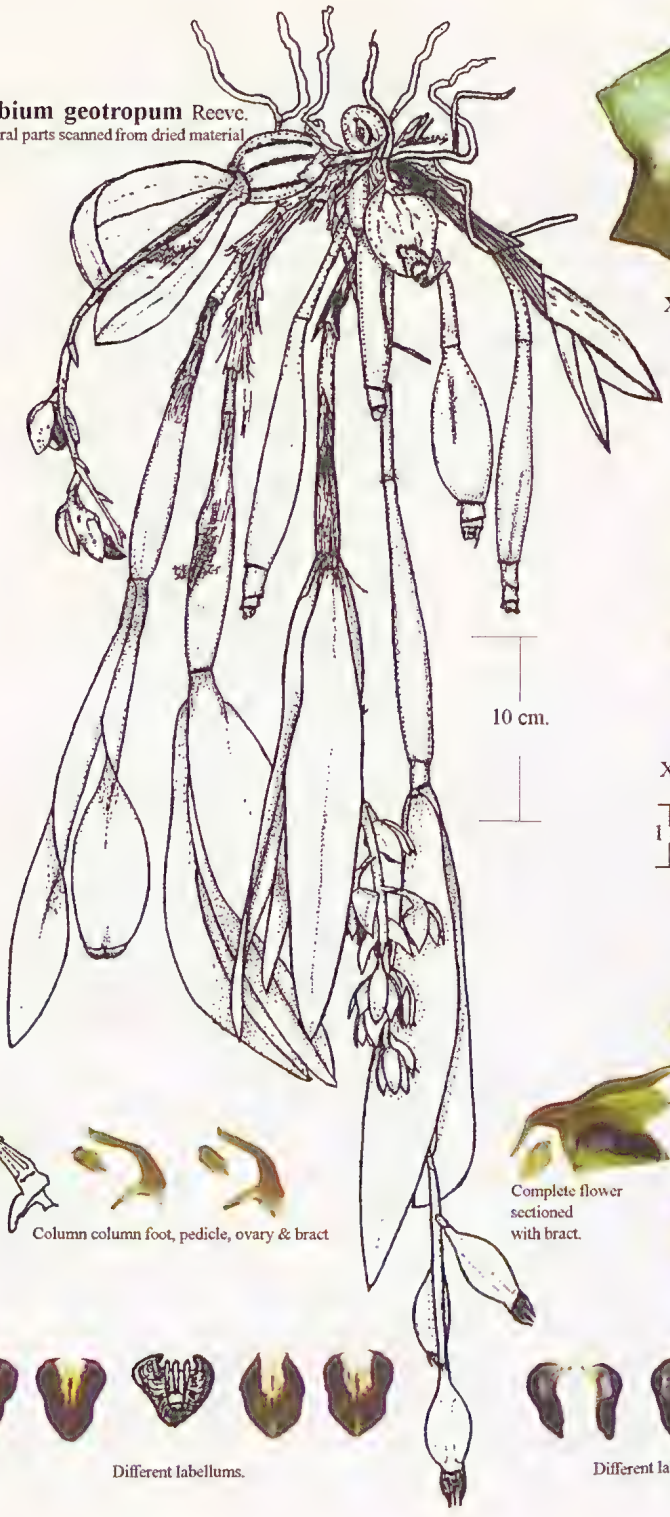
Medium to large epiphytic pendent herb to 60 cm long. **Roots** thick, flexuous, glabrous, white with greenish tips, to 0.4 cm diameter. **Rhizomes** extremely short. **Pseudobulbs** thick, clavate, with a slender basal section, somewhat moniliform, dilated apically, shallowly grooved with age, yellowish brown to dark brown, shiny, 8-noded, 5-27 x 0.8-3.0 cm. Leaves large in relation to the stems, 2-3 (small plants may have 1 leaf), pendent, occasionally spreading at the tips, ovate-elliptic to lanceolate, acute, glabrous, leathery, mid- to dark-green, sometimes suffused with purple, 6-24 x 1.8-5.5 cm. **Inflorescences** apparently terminal, pendulous, often partly enclosed by the leaves, 3-12-flowered; peduncle 3-18 cm long; rachis 2-14 cm longs bracts obovate (spathulate, concave, subacute, 0.6-0.8 x 0.5 cm. **Flowers** medium-sized for section, fleshy, glabrous, not usually widely opening, quite variable in size even on the same inflorescence, 1.5-2.5 cm diam., lasting several weeks at least, not perfumed., the tepals pale green with the outside of sepals sometimes spotted or suffused purple; labellum dark purple except for a large white callus and the underneath mid-line which is green near the apex and whitish near the base. **Ovary** green to purple, 6-grooved; ovary and pedicel 1.0-1.8 cm long. Dorsal sepal oblong-ovate, obtuse, 1.4-1.9 x 0.8-0.95 cm. **Lateral sepals** obliquely triangular, acute, 1.5-1.9 x 1.0-1.2 cm at the base, forming a blunt mentum 0.6-0.8 cm long. **Petals** rhombic-elliptic, acute, 1.5-1.8 x 0.79 cm. **Labellum** ovate with small lateral lobes and the midlobe margins incurved (subcordate when expanded), 1.3-1.4 x 0.7-0.9 cm (up to 1.4 cm wide when expanded); callus prominent, of 3 parallel ridges, 0.7-0.75 x 0.3 cm. **Column** whitish with slight purplish colouration below stigma, 0.4-0.45 x 0.4 cm; column-foot green at base, 0.5-0.57 cm long; anther cucullate, greenish-white, 0.2-0.25 x 0.2-0.25 cm. **Capsules** commonly seen in nature, 5-6 x 2.5 cm; seeds orange-yellow.

DISTRIBUTION: Papua New Guinea. Enga Province: Mt Ambua; Western Highlands Province: Ming District; Southern Highlands Province: Mt Giluwe; Morobe Province: Wau.

HABITAT: Pendulous epiphyte on the trunks of tree ferns, *Nothofagus, Pandanus*, and *Papuacedrus* trees in moss forests at 2000-2850 metres. It possibly occurs at lower altitudes. Vernacular: Kalapu (Reeve 1983).

NOTES: A cryptic species which is difficult to see as the pseudobulbs hang close to a tree trunk or the underside of a branch and are buried in a carpet of loose moss. They are also of a similar colour to the constantly wet bark and the leaves are of a similar colour to the moss, but with a blue tinge. Mature plants hang barely clear of the moss and have a pendulous raceme which is almost engulfed by the 2-4 leaves which do not spread more than 30°, as if providing an umbrella to keep the flowers dry. The flowers are waxy with a stigma that overflows with copious amounts of fluid that does not come in contact with the pollinia. The pollinia is softly waxy, more so than any other species in the section Latouria and the anther cap is extremely easy to disturb. I was fortunate to observe the pollination of several flowers by medium sized flies. At the time of pollination there was no apparent scent but it was obvious that something was driving these flies into a frenzy, maybe it could have been the dark colour of the labellum which resembles dried meat with its well defined white calli almost maggot-like. The seed capsules are large for the size of the plant and the crowded leaves keep the dispersing seed dry without the capsule becoming clogged with

Dendrobium geotropum Reeve.
Sectioned floral parts scanned from dried material.
Fig. 6.



X 2

Sepals & petals with column.

10 cm.

X 1

1 cm.

Sepals & petals with column removed.

Complete flower
sectioned
with bract.

Column column foot, pedicle, ovary & bract

Different labellums.

Different labellums sectioned & pressed

1A. *Denbrobium geotropum* on host tree. Some moss removed to expose plant. Photo by Justin Tkatchenko

1B. *Denbrobium geotropum* on host tree, close up. Photo by Justin Tkatchenko

1C. Typical forest where *Dendrobium geotropum* is found.

1D. *Denbrobium geotropum* on tree fern, exposed after fire.

moisture or fungus in this constantly moist environment.

CULTIVATION: Rare in cultivation and to date no information is at hand. I have raised this species from seed and the seedlings are still in the flasks.

7. *Dendrobium spectabile* (Blume) Miq., *Fl. Ind. Bat.* 3: 645 (1855).

Basionym: *Latouria spectabile* Blume, *Rumphia* 4: 41, t.195, f.1 & t.199C (1850); *Latourorchis spectabile* (Blume) Brieger in Schltr., *Die Orchideen* (ed. 3) 1(11/12): 727 (1981); *Sayeria spectabilis* (Blume) Rauschert, *Feddes Rep.* 94(7-8): 468 (1983). Type: "In Nova New Guinea in arboribus", *Latour-Leschenault s.n.* (holo L).

Dendrobium tigrinum Rolfe ex Hemsley, Ann. Bot. 5: 507 (1891). Type: San Cristobal , *R.B. Comins* 187 (holo K). **See Fig. 7. Plates 2B, 3D.**

Epiphytic herb. **Pseudobulbs** clustered, cane-like, to c. 40 x 1-1.3 cm, 5-8 nodes below leaves, swollen at base. **Leaves** 4-6, suberect, coriaceous, elliptic, obtuse, to 23 x 4-8 cm, shortly petiolate. **Inflorescences** emerging from just below leaf-bases, erect, 20-40 cm long, few-many-flowered; peduncle terete, bearing 4-6 small sheaths; bracts elliptic-lanceolate, acute, 1-1.3 x 0.4 cm long. **Flowers** large, somewhat grotesque, yellow, commonly heavily mottled with maroon on sepals and petals, lined with maroon on tip and with a white callus; pedicel and ovary 4-6 cm long. **Dorsal sepal** recurved, lanceolate, acuminate, 3-6 x 0.5 cm, with somewhat undulate margins. **Lateral sepals** recurved, lanceolate - falcate, acuminate, 3-6 x 1.3 cm, with somewhat undulate margins; mentum obliquely conical, 1.0 cm long. **Petals** linear - lanceolate, acuminate, somewhat twisted, 4 x 0.6 cm, with undulate margins. **Labellum** 3-lobed, recurved, 4 x 2.2 cm; lateral-lobes erect, subquadrate-semicircular, rounded in front; mid-lobe much longer than lateral-lobes, lanceolate, acuminate, undulate - twisted; callus 3-ridged, raised at base and apex. **Column** short, 3 mm long; foot 8.5 mm long.

DISTRIBUTION: Indonesia. Irian Jaya (Smith 1909). New Caledonia (one plant recently collected from the north west end of the island). Papua New Guinea, Bougainville and the Solomon Islands. (Cribb 1983). I have observed this species in Papua New Guinea at the following locations: Sogeri Plateau, Brown River and Vanapa River in the Central Province; Lae, Mount Gibensis, Markham Valley, Morobe Province; Torricelli Mountains, West Sepik Province.

HABITAT: Epiphyte in lowland swampy forest and lower montane forest on *Casuarina* or on coconut palms (*Cocos nucifera*), rubber trees (*Hevea brasillensis*), and on rain trees (*Samanea saman*) in Lae. It ranges from sea level to 1100 metres.

NOTES: *Dendrobium spectabile*, one of the most widely distributed species in the section, was first brought into cultivation around 1898 (Schlechter 1911-14). As it's epithet suggests, it is probably the most spectacular species in the section when in flower. It has been extremely described as baby serpents fighting over meat at feeding time or a gynaecologists nightmare.

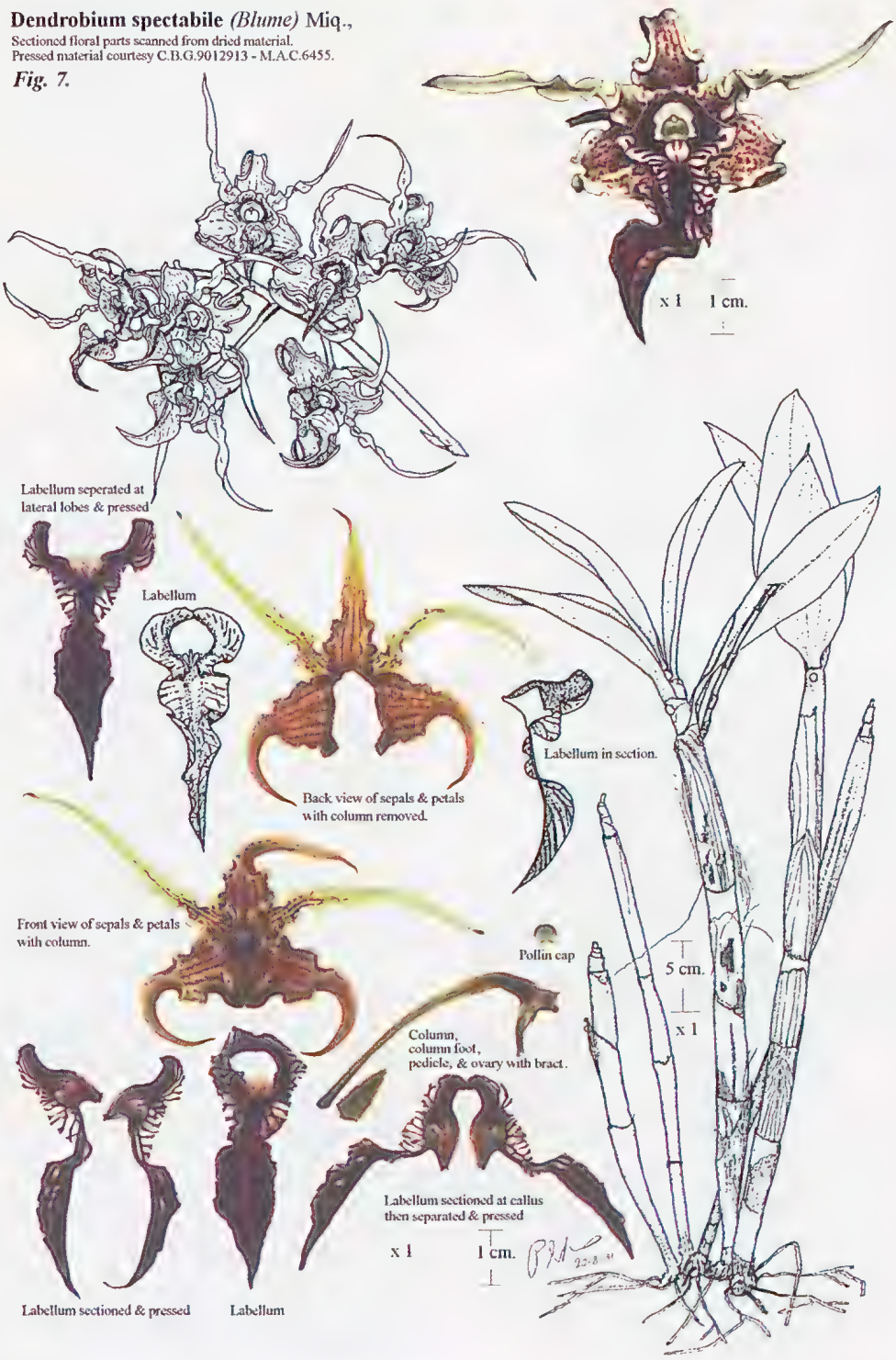
Dendrobium spectabile is allied to *D. alexandrae* but is recognised by its very undulate floral segments and the longer lanceolate labellum mid-lobe which is striped with purple rather than being spotted.

Habitats in which I have observed this species are extremely variable. At the Sogeri Plateau in Papua New Guinea, at an altitude of approximately 400 metres, this species grows high on the trunks of rubber trees. In the Markham Valley PNG, at an altitude of between 50 to 100 metres, it grows fully exposed high in tree tops in hot steamy coastal swamp forest. This was very different to the upper creeks of the Brown River PNG, at an altitude of 1000 to 1200 metres. Here, in one blind gully large specimens grew on the trunks of very old trees fully exposed to strong light. This is the only time that I have seen this species in large colonies. Some trees had up to 30 or more plants growing on them. These trees were well anchored along the exposed ridges of a small plateau on top of a high cliff face where the plants, at night and in the the morning, were bathed in mist from the valleys below. At daybreak the first sunlight streaks across the horizon thus warming these plants and drying out the moisture that has accumulated on them over night. The host trees on which I have observed this species are *Anisoptera sp.* and rain trees.

CULTIVATION: *Dendrobium spectabile* thrives in a heated glasshouse or outside in full sun in the tropics with

Dendrobium spectabile *(Blume)* Miq.,
Sectioned floral parts scanned from dried material.
Pressed material courtesy C.B.G.9012913 - M.A.C.6455.

Fig. 7.



2A. *D. convolutum* growing at National Capital Botanical Gardens, Port Moresby.

2B. *Denbrobium spectabile* (Blume) Mig. Plant grown by P. Spence.

Photo by D. Titmuss

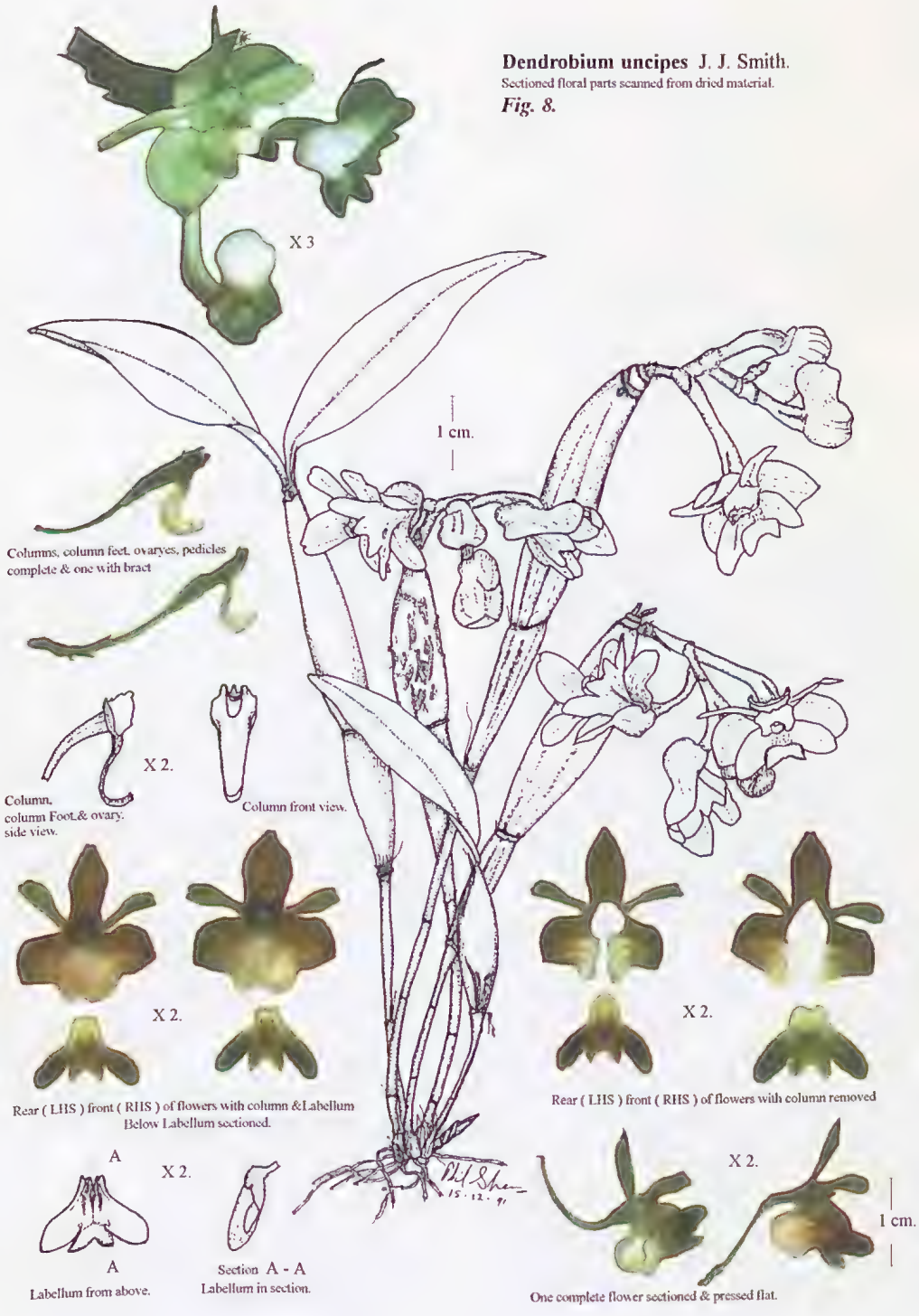
3A. *Denbrobium geotropum* freshly opened flower. Photo by Phil Spence

3B. *Denbrobium uncipes* J.J. Smith. Plant grown by P. Spence.
Photo by D. Titmuss

3C. *Denbrobium alexandrae*. Plant grown by P. Spence. Photo by D. Titmuss

3D. *Denbrobium alexandrae* Schltr. (top).
Dendrobium spectabile (Blume) Mig. (bottom).
Plants grown by P. Spence. Photo by D. Titmuss

Dendrobium uncipes J. J. Smith.
Sectioned floral parts scanned from dried material.
Fig. 8.



no shading necessary. Plants will also grow very easily in intermediate conditions or even semi-cool to about 10°C with the odd night to 5°C. The chill of the oncoming winter nights initiates flowering. My plants flower in mid to late autumn. Racemes are rarely produced from the new pseudobulbs. The older pseudobulbs flower for many years until the pseudobulb starts withering away, some in excess of 12 years. The inflorescences usually arise from under the leaves, rarely from the stem apex. Each inflorescence carries as few as seven or as many as twenty-two flowers.

Mature plants are best when they have been established for a long period in a well drained shallow pot, about 25 cm deep. The potting material is a hard pine bark with polystyrene beads, keeping the plant dry for a few days to allow any damage that might have occurred to dry and seal. After potting I then start a heavy watering and feeding program till the plant is established and then taper off the watering to keep the bark or potting mix barely moist.

This species is widely grown and for this reason it has been the subject of many crosses, both within section Latouria and other various species in other sections of *Dendrobium*. Unfortunately, this interesting species has only produced a small number of successful hybrids, the majority being disastrous.

8. *Dendrobium uncipes* J. J. Smith, Bull. Jard. Bot. Buitenzorg (ser. 2) 3: 72 (1912); *Katherinea uncipes* (J. J. Smith) Hawkes, Lloydia 19: 98 (1956); *Sayeria uncipes* (J. J. Smith) Rauschert, Feddes Rep. 94 (7-8): 468 (1983). Type: Dutch New Guinea [Irian Jaya]; Cyloops [Cyclops] Mountains, alt. c. 900 m, June 1911, K Gjellerup 568 (holo BO). **See Fig. 8. Plate 3B.**

Epiphytic herb. **Pseudobulbs** ovoid, c. 8-angled, 12.5 x 1 cm, brownish-yellow. **Leaves** 2, fleshy-coriaceous, ovoid, narrowed and unequally bidentate at apex, about 7 x 2.5 cm, dark green. **Inflorescence** erect, 3.2 cm long, c. 3-6 flowered; peduncle 2.6 cm long, x 0.2 cm diam., somewhat verrucose; bracts triangular, acute, concave, 0.37 cm long. **Flowers** small, fleshy, yellow-green and white. **Dorsal sepal** oblong-ovate, bidentate, 0.85 x 0.5 cm, minutely furfuraceous-punctate on outer surface. **Lateral sepals** obliquely oblong-elliptic, obtuse, 0.83 x 0.78 cm; mentum subsaccate, compressed, 0.53 cm long. **Petals** uncurved, falcate, oblong-oblanceolate, obtuse, minutely erose, 0.83 x 0.25 cm. **Labellum** 0.68 x 1.3-1.0 cm; lateral-lobes spreading, narrowly elliptic, subacute; mid-lobe bifid with a blunt mucro in the sinus, each lobule resembling a smaller lateral-lobe; callus fleshy, 0.37 cm, 3-ridged, about half the length of the labellum. **Column** 0.35 cm long; foot incurved, 0.5 cm long.

DISTRIBUTION: Indonesia. Irian Jaya: Djajapura area, Cycloop Range (Smith 1912).

Papua New Guinea: Sundaun Province; Torricelli Mountains (Reeve, pers. comm.).

HABITAT AND ECOLOGY: Epiphytic in primary forest at c. 900 metres.

CULTIVATION: The plant described in this note was one of the few plants collected by Reeve and cultivated at Laiagam in the Enga Province, Papua New Guinea, and is now in cultivation in Sydney Australia. This plant thrives in an open bush house, with a temperature range of 2°-35°C throughout the year. It is potted in pine bark which has a light moss covering and is hanging rather than sitting on a bench. It is watered daily early in the morning.

NOTES: Reeve's drawing shows this species with a pendulous habit but in cultivation it grows erect. The raceme takes several months to develop. As the buds grow they take the shape of the figure eight when viewed from the side. The lettuce-green flowers open to reveal a green-white labellum with a white bifid mid-lobe which slowly turns green-yellow just before the flowers collapse. They last two to three months.

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The assistance of Dr Mark Clements, Dr Phillip Cribb and Tom Reeve in obtaining archival material is greatly appreciated. I wish to thank Peter Fetherstone and David Titmus for helping with the photography. The field observation extended over almost 30 years and among the many who assisted at various times were †Rev Norman Cruttwell †Geoff Elworthy, †Frank Genarti, Neville Howcroft, †Andreè Millar, Tom Reeve, Mike Simmons, Dr Geoff Stocker and Justin Tkatchenko. Special thanks to Dr Geoff Stocker, Phillip Cribb and David Jones who read and commented on the manuscript.

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or
TYPE: Papua New Guinea; Western Highlands Province, 24 miles (38.4 km) from Wabag, Wabag-Laiagam road, 5°25'S, 143°25'E, alt. 9000 ft. (c. 2500 m), 20 July 1962, *J.S. Womersley* NGF 15210 (Holotype CANB 113530!).

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